# Coordinated Meetings

# ALLIED EXHIBITS

Chicago . . . September 20-23


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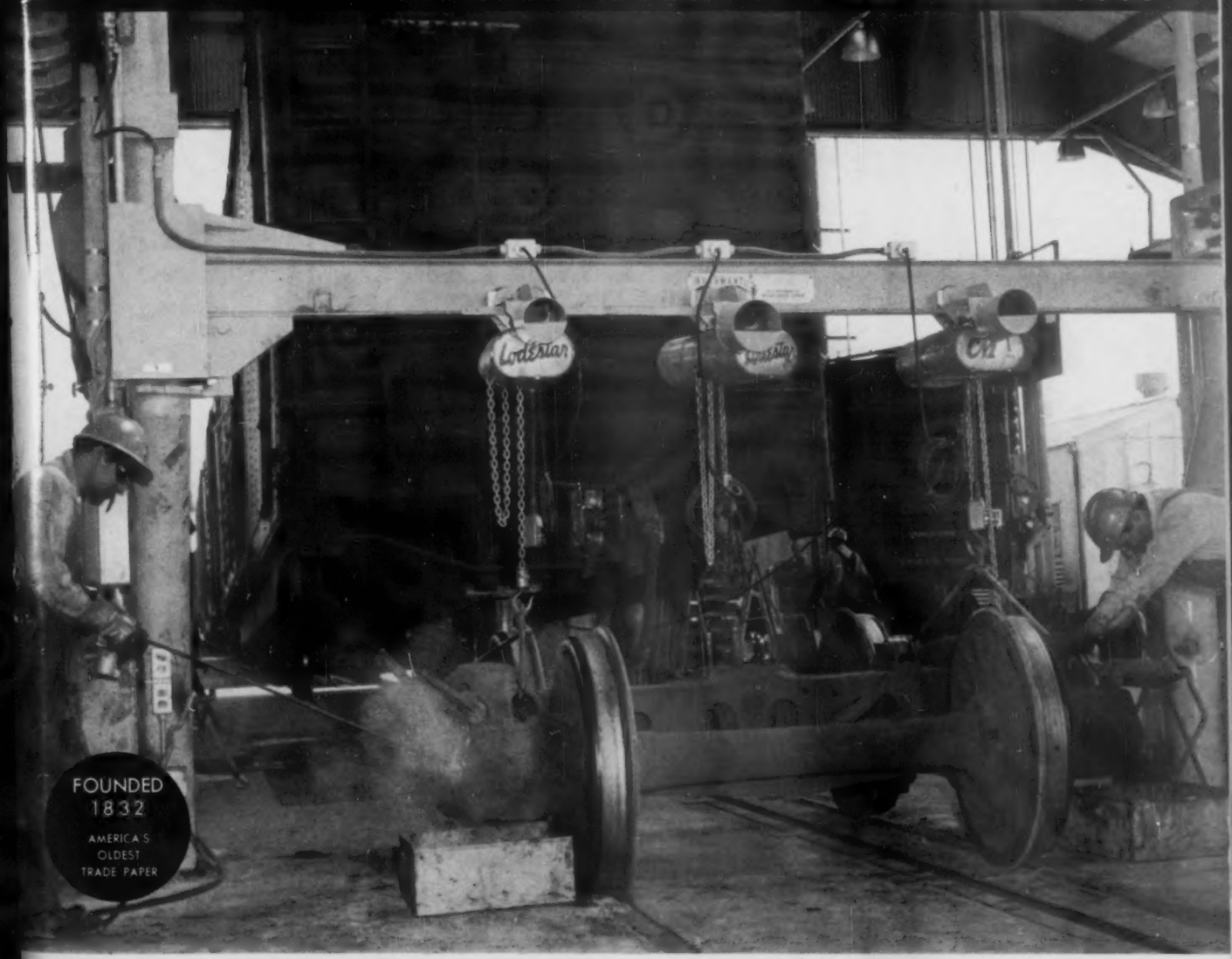
RAILWAY

# LOCOMOTIVES AND CARS

A SIMMONS-BOARDMAN TIME-SAVER PUBLICATION SEPTEMBER 1959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SP Adopts One-Spot Car Repairs . . . p. 41

# Maintain high engine availability

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The experience of leading railroads and the approval of all manufacturers of railroad diesels are behind Texaco 1693 Dieseltex HD-40. Here's why:

**1693 Dieseltex keeps top decks** and engine interiors clean. Its detergent and dispersive action prevents formation of harmful deposits. Rings and valves stay free for proper compression and full power. Its exceptional filterability for a dispersant type oil results in reduced ring, liner and bearing wear.

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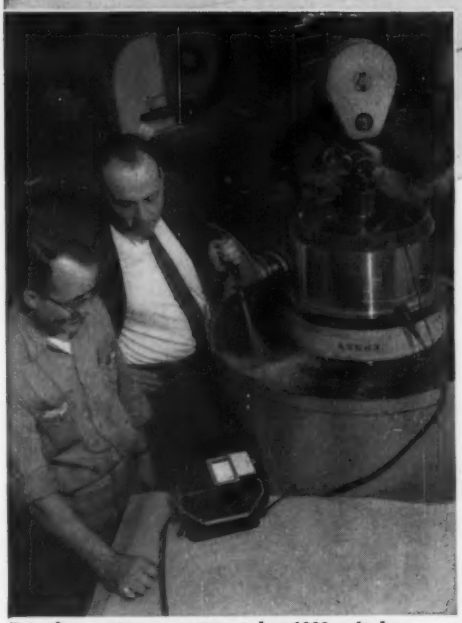

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# from Callaway Mills–
# WIKIT
## journal lubricators

## ....with 4 exclusive features!

● **Specially Constructed Center Wick**—One-third of the pile fabric is in the center wick. If there is any oil in the box, WIKIT absorbs it!

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RAILWAY
# LOCOMOTIVES AND CARS

The Oldest Trade Paper
In the United States

September 1959—Vol. 133 No. 9

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# REPORT FOR SEPTEMBER

## Brake Inspection Modified

Operation of trains for distances greater than 500 miles without intermediate brake inspection could be authorized by the ICC on the basis of a modification which the Commission recently made in regulations imposed under the Power Brake Act of 1958. Simultaneously, however, the Commission denied requests for exceptions to the original 500-mile limit which were filed by five western roads.

The AAR had sought modification of the second paragraph of Section 132.12 of the Rules for Inspection, Testing and Maintenance of Air Brake Equipment. This section requires the establishment of "designated intermediate inspection points" at terminals no further than 500 miles apart. At these points the following train brake test standards must be met:

- Brake-pipe leakage must not exceed 5 psi per min;
- Brakes must apply on each car with a 20 psi reduction;
- Brake rigging must be in safe condition.

The AAR proposed that a footnote be added reading: "Relief from the requirements of this section will be granted upon an adequate showing by the carrier." The Commission found that relief can be granted only "on the merits of each individual case," that the five roads had not adequately supported their cases, and that all the railroad petitions would be denied.

The footnote finally included with Section 132.12 applies only to the 500-mile limit. It reads: "Relief from the 500-mile inspection requirement of this section will be granted upon an adequate showing by an individual carrier." The Commission explained that the only basis for this relief will be a clear showing that it is "for the sole purpose of achieving safety."

By Commission action on the five individual cases, operating complications and added financial burdens were shown to be no basis for relaxation of the 500-mile limit.

## Shop Construction Programs

The Canadian National has awarded contracts for the construction of a diesel shop of structural steel in the Moncton hump yard. Cost of the 263-ft by 340-ft facility will be about $2,000,000.

The Western Pacific will build a three-track diesel shop at Oroville, Calif., at a cost of $1,200,000. The shop building, 327 ft by 185 ft, will include a 69-ft by 23-ft drop pit, six inspection pits, storeroom and

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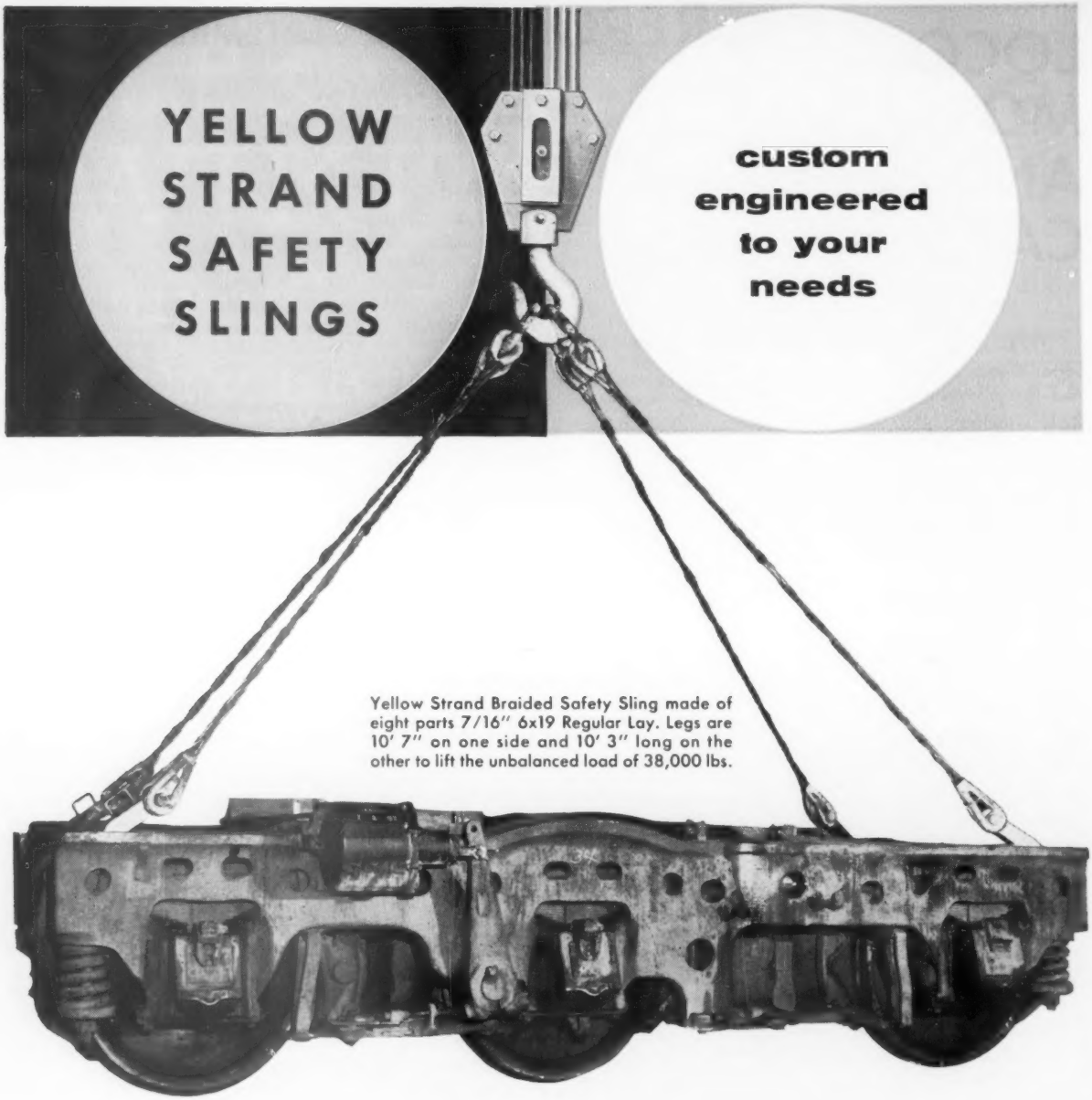
# YELLOW STRAND SAFETY SLINGS

**custom engineered to your needs**



Yellow Strand Braided Safety Sling made of eight parts 7/16" 6x19 Regular Lay. Legs are 10' 7" on one side and 10' 3" long on the other to lift the unbalanced load of 38,000 lbs.

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SLINGS

CLIPS

# Clair B. Peck

**Clair B. Peck, retired editor of Railway Locomotives and Cars, died August 13, 1959, in Newark, N.J., following a long illness. Mr. Peck was born in Pierson, Mich., on June 24, 1884, attended public school in Belding, Mich., and graduated from Michigan Agricultural College (BS in ME) in 1907.**

**He worked as a draftsman for the Duluth, South Shore & Atlantic at Marquette, Mich., and on special assignment in the mechanical engineer's office of the Santa Fe at Topeka, Kan., prior to joining Simmons-Boardman in 1914. Mr. Peck began as an associate editor for the Mechanical Edition, Railway Age Gazette; and was then successively western editor, managing editor and editor of Railway Mechanical Engineer. Mr. Peck was the first editor of Railway Locomotives and Cars after the name was changed from Railway Mechanical and Electrical Engineer in 1953. Following his retirement in 1954, he continued to serve as a consulting editor. From 1948 until 1954 he was editor of the Locomotive Cyclopedia and the Car Builders Cyclopedia. He had served as a director of the Simmons-Boardman Publishing Corp.**

**Mr. Peck was a Fellow of the American Society of Mechanical Engineers, and was chairman of the ASME Railroad Division in 1934. He had also served terms as vice-president of the ASME Executive Committee, and as chairman of the ASME Committee on Professional Divisions, ASME Committee on Publications, and the ASME Board on Technology. Mr. Peck was a member of Tau Beta Pi and Pi Tau Sigma, honorary engineering fraternities.**

*(Continued from page 5)*

locker room, and other repair facilities. Current work, Phase 1 of a two-year construction program, will cost about $300,000 and will be completed in December.

## 'Push-Pull' Diesels Start Shakedown

The Chicago & North Western is using in suburban service the first of seven locomotives converted to handle "push-pull" commuter trains. C&NW shops have been modifying seven General Motors F-7 units for the special trains at a total cost of $262,000.

Eight of the 36 Pullman-Standard built "push-pull" cars equipped with "cabs" and locomotive-type controllers and air-brake controls (RL&C, January 1959, p 30). The seven locomotive units will provide power for the trains, with one or two units being held as stand-bys.

The modified locomotives are identical to two F-7's which have been equipped as stand-by power for CN&W's "bi-level" streamliners (RL&C, November 1958, p 32). Diesel-driven 480-volt alternators provide power for electric car heating and air-conditioning units. The alternators are driven by 575-hp Cummins diesels.

# Personal Mention

**Atlantic Coast Line.**—*Waycross, Ga.:* J. C. PARKER appointed master mechanic, Western Division. ROBERT W. TONNING, JR., appointed shop superintendent, succeeding Mr. Parker. Mr. Tonning formerly shop superintendent, Emerson Shops, Rocky Mount, N.C. *Rocky Mount:* ROBERT B. DULANEY appointed general foreman. Formerly general supervisor roadway machinery at Savannah, Ga.

**Canadian National**—*Transcona, Man.:* STANLEY BACHINSKY, appointed superintendent of motive power and car equipment. Formerly held similar position at Fort Rouge, Man. *Moncton, N.B.:* K. W. THOMSON appointed assistant superintendent motive power and car shops. Formerly superintendent of motive power shops at Transcona, Man.

**Canadian Pacific.**—*Winnipeg, Man.:* T. F. DONALD, superintendent motive power and car department, appointed superintendent motive power and rolling stock. J. J. RABY, master mechanic, appointed assistant superintendent motive power and rolling stock. S. A. JONES, general inspector diesel equipment, appointed supervisor diesel equipment. *Vancouver, B.C.:* W. STEWART appointed superintendent motive power and rolling stock. Formerly assistant superintendent motive power at Winnipeg. A. T. REYNOLDS, master mechanic, appointed assistant superintendent motive power and rolling stock. E. H. HANSON, supervisor internal combustion equipment, appointed supervisor diesel equipment.

**Detroit, Toledo & Ironton.**—*Dearborn, Mich.:* ALBERT B. HARRIS, superintendent motive power and equipment, retires November 1. Position to be abolished. M. B. CROOKS, superintendent car department, now reporting to vice-president-operations. *Flat Rock, Mich.:* A. W. GODWIN appointed superintendent locomotive department. D. H. ZENZ appointed general enginehouse foreman succeeding Mr. Godwin. *Jackson, Ohio:* OTTO L. HOFFMAN, general foreman, appointed superintendent, Jackson shop.

**Elgin, Joliet & Eastern.**—*South Chicago, Ill.:* MAURICE C. CRAM appointed road foreman of engines—assistant trainmaster, Gary Division.

**Minneapolis & St. Louis.** — *Minneapolis, Minn.:* F. E. CUNNINGHAM appointed assistant mechanical engineer.

**New York Central.** — *Beech Grove, Ind.:* RICHARD H. MICHALEK, appointed assistant superintendent-locomotive. JOSEPH C. WILLIAMS, general foreman, appointed general foreman-locomotive, succeeding Mr. Michalek. *Bellefontaine, Ohio:* THEODORE R. WINDSOR appointed diesel locomotive inspector.

**New Haven.**—*New Haven:* JOHN L. CHILLINGTON appointed chief locomotive inspector, maintenance of equipment shop. ROLAND E. GUSTAFSON appointed general foreman, wheel and truck shop.

**Norfolk & Western.**—*Roanoke, Va.:* A. P. GILSDORF, superintendent car department, retired. H. B. PAYNE, general master mechanic, retired. Position abolished. WILLIAM S. GARRETT, electrical engineer, appointed to newly created position of assistant superintendent motive power-locomotive. *Williamson, W. Va.:* ARTHUR L. WOOTEN, enginehouse foreman, appointed general foreman, succeeding G. W. STRUM, retired.

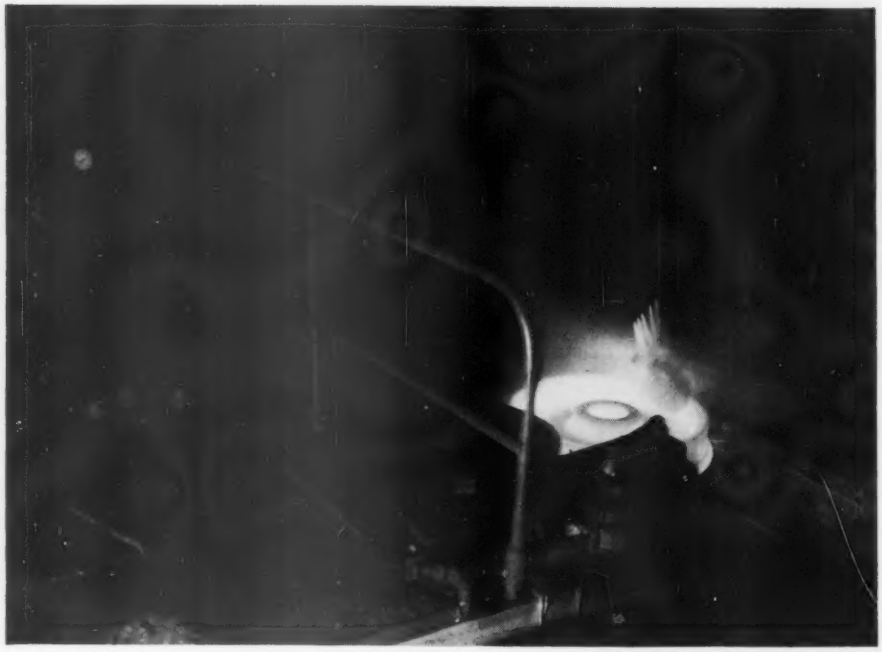
**Pennsylvania.**—*Cincinnati, Ohio:* HENRY W. WITTMAN, appointed master mechanic, succeeding RICHARD C. AMBELONG, transferred to Chicago. Mr. Wittman formerly assistant master mechanic, Pitcairn (Pittsburgh), Pa.

**Santa Fe.**—*Galveston, Tex.:* J. W. LUKE appointed mechanical superintendent, Gulf Lines, succeeding O. G. PIERSON, retired. *San Bernardino, Cal:* L. L. LUTHEY ap-

*(Continued on page 10)*

# Because Armco Wheels are rolled

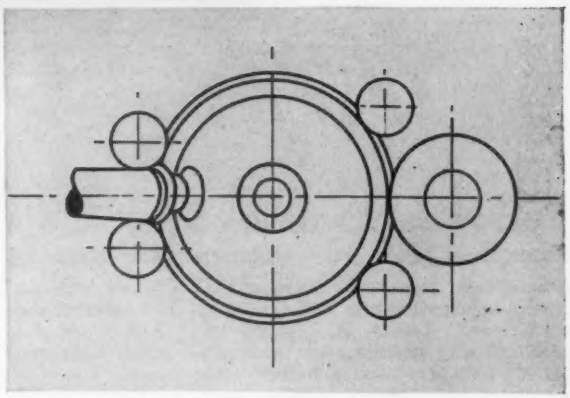
## they keep rolling longer



New steels are born at Armco

Powerful rolling pressures impart greater strength and toughness to wheels during working to final size.

**From 1932 to 1957, Armco shipped more than one million one-wear wrought steel wheels. Only six of these have been reported defective. This is 99.9994% performance. Forging is one big reason. Here's another:**



### Armco Wheels are rolled

After forging, every Armco Wheel is rolled in a powerful mill. Flange and tread contours are formed and wheel diameter reaches final size. But equally important, as mighty forces knead the steel it becomes stronger and tougher—develops even greater resistance to wear, shock and pounding.

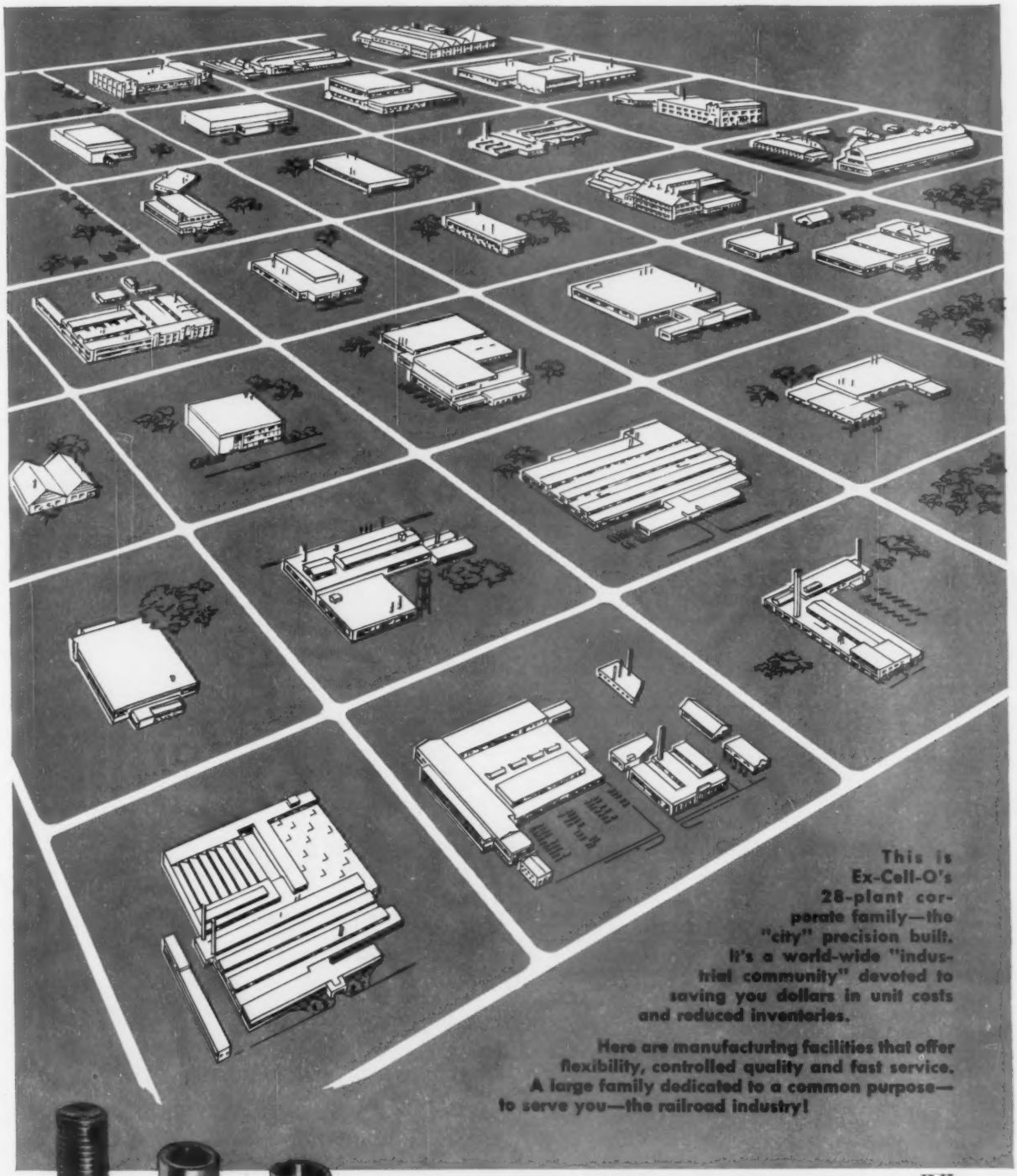
Under your cars these durable wheels mean long trouble-free service, low lifetime cost, greater dependability, more safety. For price and delivery information on Armco Wrought Steel Wheels, call your nearby Armco Sales Office or write: Armco Steel Corporation, 2939 Curtis Street, Middletown, Ohio.

**ARMCO STEEL**

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

*READY TO SERVE THE RAILROAD INDUSTRY . . .*

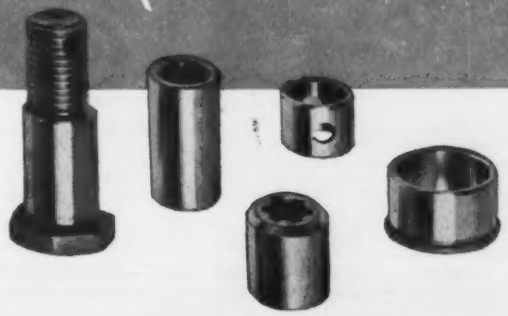
# THE CITY PRECISION BUILT



This is Ex-Cell-O's 28-plant corporate family—the "city" precision built. It's a world-wide "industrial community" devoted to saving you dollars in unit costs and reduced inventories.

Here are manufacturing facilities that offer flexibility, controlled quality and fast service. A large family dedicated to a common purpose—to serve you—the railroad industry!

59-50



EX-CELL-O CORPORATION Railroad Division

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

(Continued from page 7)

pointed superintendent of shops, succeeding Mr. Luke. *Chicago:* M. B. ADAMS appointed master mechanic, succeeding Mr. Luthey. C. A. WILSON appointed general supervisor of diesel engines, succeeding Mr. Adams; W. E. SEAGRAVES, assistant supervisor of diesel engines, appointed assistant general supervisor of diesel engines, succeeding Mr. Wilson. *Arkansas City, Kan.:* D. M. MILLER appointed master mechanic, Oklahoma division, succeeding PAUL A. BUCKMAN, retired.

**Western Maryland.**—*Hagerstown, Md.:* H. W. REED, master mechanic, Eastern division, retired. W. P. GILFORD, master mechanic, Western division, Cumberland, Md., appointed master mechanic-system. T. B. DAVIS, master car builder, appointed superintendent car equipment. R. H. STOCKDALE, electrical supervisor, appointed engineer, electrical maintenance. M. A. WEINER, supervisor of welding, appointed engineer reclamation and welding. J. L. TRIPLETT, engineering assistant to superintendent motive power, appointed engineer equipment design and maintenance. D. G. DRAWBAUGH, JR., engineer of tests, appointed engineer maintenance methods and procedures. H. J. KOCH, JR., assistant mechanical engineer, appointed assistant engineer equipment design and maintenance. R. R. HOLMES, chemist, appointed chief chemist. W. B. HARRIS, supervisor diesel shops, appointed supervisor diesel equipment. L. E. REED, assistant general foreman, Hagerstown shops, appointed general foreman. All former positions abolished. W. M. BREWBAKER appointed superintendent of shops. R. D. HOFFMAN appointed general car inspector. *Port Covington, Baltimore, Md.:* W. S. CHANEY appointed assistant master mechanic. Position of general foreman, Baltimore Terminals, abolished. *Cumberland, Md.:* R. B. MARTIN appointed assistant master mechanic, Maryland Junction.

# Supply Trade Notes

ALLIED STEEL CASTINGS CO.—*Robert C. Geekie* appointed southwestern representative.

■

ACF INDUSTRIES, AMERICAN CAR & FOUNDRY DIVISION.—*Arthur F. Loveland,* assistant works manager, appointed works manager of Berwick, Pa., plant.

■

GENERAL MOTORS DIESEL LIMITED.—*G. M. Lynch* appointed district manager for British Columbia. *Walter Bedford* appointed district manager for Alberta, Saskatchewan and Manitoba, succeeding Mr. Lynch. *G. L. Stephenson* appointed district service manager for Ontario and Western Quebec, succeeding Mr. Bedford. Mr. Stephenson formerly engaged in engine scheduling at London, Ont.

■

SPERRY PRODUCTS, INC.—Four sales districts established. New district managers, reporting to *Henry T. Lowell,* general sales manager, are: *Tarcy W. McFarlan,* Eastern

(Continued on page 117)

# Orders and Inquiries for New Equipment

## Placed Since the Closing of the August Issue

## Diesel-Electric Locomotive Orders

| *Road and builder* | *No. of units* | *Horsepower and type* | *Detail* |
|---|---|---|---|
| NORTHERN ABERTA: | | | |
| General Motors Diesel | 5 | 1,250 hp | GMD-1's. Cost, $975,000. |
| ROCK ISLAND: | | | |
| Electro-Motive | 10 | 1,800 hp road switch. | GP-18's. For November delivery. |
| SOUTHERN PACIFIC: | | | |
| Alco Products | 12 | 1,800 | DL-701's. Six with cut-down hoods. Dynamic braking. Being delivered. |
| | 3 | 2,400 | DL-600's, with cut-down hoods. Dynamic braking. braking. Being delivered. |
| Electro-Motive | 20 | 1,750 to 1,800 | GP-9's, with cut-down hoods. For delivery this month. |
| TENNESSEE, ALABAMA & GEORGIA: | | | |
| Electro-Motive | 1 | 1,800 road switcher | GP-18. For December delivery. |

## Freight-Car Orders

| *Road and builder* | *No. of cars* | *Type of car* | *Detail* |
|---|---|---|---|
| ATLANTIC COAST LINE: | | | |
| ACF Industries | 700 | Box | 50-ft. with roller bearings. 100 to be equipped with special rack devices. |
| | 300 | Hopper | 70-ton phosphate, with roller bearings. For Oct.-Nov. delivery. |
| BALTIMORE & OHIO: | | | |
| Company shops | 500 | Box | 50-ton; with double doors. 400 to have load retaining devices. Approx. cost, $6,000,000. Work on order to begin four to six weeks after end of steel strike. |
| CHICAGO & NORTH WESTERN: | | | |
| Thrall Car | 150 | Cabooses | Bay window type. Cost, approx. $2,070,000. Deliveries to be at rate of 10 cars per month beginning in October. |
| ILLINOIS CENTRAL: | | | |
| Bethlehem Steel | 25 | Gondola | 75-ton. Approx. cost, $325,000. |
| LOUISVILLE & NASHVILLE: | | | |
| Pullman-Standard | 150 | Box | DF's. Approx. cost $2,040,000. Deliveries to be completed this month. 40 cars will have 15-ft doors; remainder, 9-ft. doors. |
| MINNEAPOLIS & ST. LOUIS: | | | |
| Pullman-Standard | 10 | Box | 50-ft. These cars and 4 reported in August to be equipped with Evans DF loaders. Est. cost of 14 cars, $150,000. |
| NICKEL PLATE: | | | |
| General American | 500 | Box | 50 ft 6 in.; 50-ton all steel. Est. cost, $6,000,000. 325 to be equipped with special loading devices. |
| PACIFIC FRUIT EXPRESS: | | | |
| Company shops | 1,000 | Mech. refrigerator | 50-ft, 60-ton all-purpose cars capable of operating up to 20 days without refueling. |
| | 25 | Mech. refrigerator | 50-ft, 60-ton, for handling fresh commodities. The 1,025 cars to be equipped with roller bearings, load protection devices, and 8-ft doors. Cost, approx. $27,000,000. Deliveries beginning February and completed in October. |
| SOUTHERN PACIFIC: | | | |
| Pullman-Standard | 35 | Covered hopper | 95-ton. Delivered in August. |
| General American | 50 | Piggyback flat | 85 ft. |
| TRAILER TRAIN CO.: | | | |
| ACF Industries | 200 | Piggyback flat | 500 cars to be 85-ft, roller-bearing. Cost, |
| Pullman-Standard | 300 | Piggyback flat | more than $7,500,000. |
| WESTERN PACIFIC: | | | |
| Pullman-Standard | 50 | Box | 50-ft, 70-ton DF insulated. Cost approx. $750,000. For fourth quarter delivery. Purchase of additional 50 cars also authorized. |

## Passenger-Car Orders

| *Road and builder* | *No. of cars* | *Type of car* | *Detail* |
|---|---|---|---|
| NEW YORK CITY TRANSIT AUTHORITY: | | | |
| ACF Industries | 100 | Subway | Bid of $11,492,755 submitted to Board of Estimate for approval. Contract calls for delivery of first 10 cars within 8 mo. and 20 a month thereafter. |

## Notes and Inquiries

***Louisville & Nashville*** will convert 738 hopper cars from wood to steel sides, adding about 17 years to life expectancy and cutting maintenance costs by about $100 per car per year.

***Minneapolis & St. Louis*** will repair 200 refrigerator cars for Armour & Co., under contract at its Marshalltown, Iowa, shops. Road will employ 65 additional men for the six-month, $450,000 job. Armour previous had two cars repaired by M&StL as a test. New roofs, floors, sides and insulation will be installed and the cars painted.

***Nickel Plate*** converting 165 box cars to piggyback flat cars; equipping 25 gondolas with steel covers and 65 cars for handling coil steel. Evans Products equipping 99 box cars for transportation small domestic automobiles. Bids out for 500 new box cars.

***Pennsylvania*** converting 100 automobile part cars of X 32A class into specially designed stock cars with windows cut in sides for ventilation. Roofs of all-steel cars coated with aluminum paint. Wooden rub rails provided half way up car interiors.

# MAINTENANCE GOBBLED PROFITS

## until NATIONAL entered the scene!

FLOYD ANDERSON

"Twenty-six of this road's diesel-electric units were in continual trouble," says "National" Carbon Brush Man, Floyd Anderson. "The reason," Floyd continues, "was bar burning and brush breakage on traction motors."

Floyd studied operating conditions on this road and recommended "National" grade AZY brushes. Bar burning and brush breakage stopped at once, thus extending profitable service between rebuilds.

There's expert "National" brush service within easy phoning distance of every railroad in the country. Take advantage of it. Call your "National" office locally. Or write to National Carbon Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

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## Products of Exhibitors—Allied Railway Supply Association

***(Not previously described in Railway Locomotives and Cars)***

### Chain Hoists

Four new lines of hoists introduced by the Coffing Hoist Division include the following.

The Quik-Lift air hoist, available in 500-, 1,000- and 2,000-lb capacities, has 20 neoprene seals which prevent the loss of lubricant and air. Unitized motor construction permits complete removal of motor without disturbing gear, brakes, or even removing the load.

The heavy-duty Quik-Lift electric hoist, designed for continuous service, comes in 12 models with capacities from ½ to 3 tons and speeds from 9 to 36 ft per min.

The Series S electric hoist models are equipped with push-button as well as pendant control. Both permit load movement of a fraction of an inch.

The lightweight sealed ratchet lever hoist features a brake chamber neoprene-sealed in five places against water, oil, chemicals and dirt. Model capacities range from ¾ to 6 tons. Frames are aluminum alloy.

The CA-10 model ½-ton aluminum spur gear hoist has an 8-ft standard lift and low headroom. It weighs 22 lb. *Duff-Norton Co., Coffing Hoist Div., Dept. RLC, Danville, Ill.*

---

### Off-Wheel Brake

The ASF Roto-Frate brake is an off-the-wheel freight-car brake which eliminates the need for a body brake. It is suspended from the truck bolster and involves the use of only one double-faced rotor per wheel and axle assembly. An air cylinder on each bolster actuates the linkage operating the brake shoes, which in turn exert equal pressure on the rotor faces. It is completely spring supported, minimizing the intensity of road shocks. The simplicity of the roto-chamber design is said to eliminate periodic cleaning and lubricating.

The brake can be installed on new or existing freight cars equipped either with solid or roller bearings. Standard designs of side frames and bolsters can be used without modification, conforming with present AAR standardization recommendations. Rotors can be bolted on to the wheel hub of a standard freight car wheel designated as Type B (10¼ in. hub diameter). The cast-steel rotor has ample fan capacity for heat dissipation.

The brake, equipped with sintered shoes, it is said, is capable of controlling the speed of a loaded car at 20 mph for 30 min on a 2 per cent grade with air chamber pressure of about 12 psi. *American Steel Foundries, Dept. RLC, Prudential Plaza, Chicago 1.*

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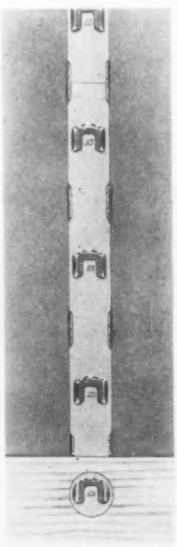

### Lading Strap Anchors

The continuous bar anchor, the door post anchor, and a newly designed retractable flat-car anchor have been added to the lading strap anchor line.

The continuous bar type for steel lining (left) is welded to the Z-bar post between steel-plate sections. It is furnished in multiple lengths with 6-in. anchor spacing. This permits multiple choice of anchor locations, "shims" out steel lining flush with wood lining in upper part of car, and provides a suitable attachment for steel lining to car side posts.

The door post anchor (right), welded to the door post, supplies multiple strapping locations. It is furnished in three 3-ft sections per door post. *MacLean-Fogg Lock Nut Co., 5535 North Wolcott ave., Dept. RLC, Chicago 40.*

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### Passenger-Car Storage Battery

The EG Exide-Ironclad storage battery is rated at 75 amp hr per positive plate, as compared with the up to 60 amp hr previously available. It is lighter in weight than any other lead-acid battery for the application, saving up to 616 lb per car. Like the MGD battery for diesel locomotive starting, the EG utilizes a new tubular-type positive plate. The tubes are made of continuous-filament sheathed within a perforated polyvinyl chloride armor. The battery has self-closing hinged vent plus and is available in 2-, 3- and 4-cell units—13 electrical sizes in all—with 8-hr capacities ranging from 375 to 1,500 amp hr. All models are available either with regular (1.250) or low (1.220) specific-gravity electrolyte. *Exide Industrial Division, Electric Storage Battery Co., Dept. RLC, Rising Sun and Adams ave., Philadelphia 20.*

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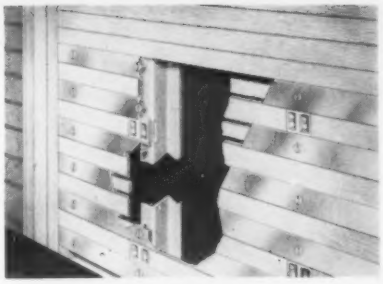
### Liquid Cleaner

Aerowash A, an all-purpose liquid cleaner for diesel exteriors, is a highly concentrated, water-base cleaner. It is said to remove heavy diesel road soils without harming paint or reducing reflectance. *J. B. Ford Division, Wyandotte Chemicals Corp., Dept. RLC, Wyandotte, Mich.*



## Side and End Linings

Line-Rite end and side linings were developed to add strength to the car interior. The assembled metal and wood and lining gives additional strength to the end of the car by distributing impacts over a larger area and allowing the corrugations in the outer steel end to exert resistance to impact as a unit. The side lining protects against damage by fork lift trucks and tractors.

Dovetailed metal sockets give solid backing the entire length of the board, locking each board positively and securely in place. The continuous steel member of the end lining, properly applied, blocks the infiltration of flour and grain into the space behind the lining.

Approximately 4,000 car sets of the end lining and approximately 200 car sets of the side lining are now in service. *Standard Railway Equipment Division of Standard Railway Equipment Manufacturing Co., Dept. RLC, 4527 Columbia ave., Hammond, Ind.*

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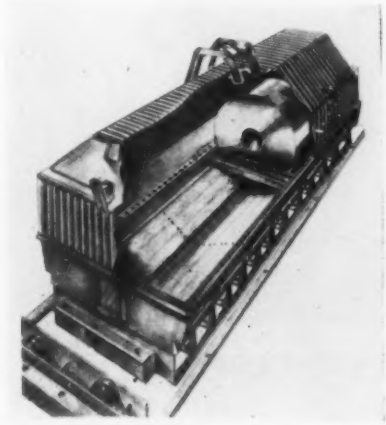

## Gondola Skid and Hood Design

Inspection and manway doors are optional equipment on a hood made to fit the standard gondola car. A car set consists of two large hoods which can easily fit all existing types of skid-equipped cars. Brackets permit lifting from trackside or overhead cranes. Damage control skids can also be supplied. The Erie and Baltimore & Ohio have made applications of this equipment.

The doors are weathertight and are easily adapted to vertical or horizontal car surfaces, or can be specified in Yocar gondola roofs and hoods.

Another steel coil skid and gondola hood combination is constructed of steel and has a low center of gravity. The only replaceable parts are the oak wood facings lining the coil cradle and the new I-beam crossbar. The coil cradle is deeply recessed. Running tracks underneath the skid provide seven points of resistance which cut down on the shifting of the entire skid. Buffer spring plates at both ends of the car absorb the shocks when coils shift. The I-beam cross-members which retain the coils can be adjusted at 1 in. intervals and are built into the skid frame to prevent damage in transit. Oak lining is added for coil protection, and a lip extends around the entire skid.

The shorter hood walls of the deep well skid permit the use of covered gondolas with lower ceiling clearances. The hoods are centrally balanced and are lifted with "C" hooks, chains and slings.

A sliding trap door fitted at both ends of the skid permits visual inspection and removal of the end coil without removing the cross-member. *Dept. DSH, Youngstown Steel Car Corp., Dept. RLC, Niles, Ohio.*

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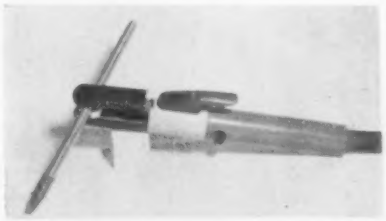

## Metal Removal Torch

The Model H-5 metal removal torch features a pushbutton air-control valve in the torch handle, molded heat-resistant jaw insulators, molded plastic upper arm lever, a heavier heat resistant silicone sleeve on the front of the torch handle, and a silicone shield on the torch head to protect the head from the extreme heat to which it is subjected. The power connection cable assembly is covered with a protective rubber boot to prevent accidental arcing while the torch is in use. Arcair electrodes up to ⅝ in. diameter can be used.

A special surface protection compound for stainless steel and machined surfaces, Protex, can be used with the Arcair process. The air blast coming from the torch will not blow it away from the surface being worked. It is applied with a paint brush, and there is no waiting period for it to dry before using the torch. *Arcair Co., Dept. RLC, P.O. Box 431, Lancaster, Ohio.*

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## Aluminum Box-Car Lining

This side wall inner lining is 40 in. high at sides and ends and weighs 1,200 lb, which is said to be a saving of 1,800 lb over steel linings. It is made of aluminum alloy 6063-T6 in sections between side posts and is attached with Pax rivets. Panels are interlocking 9 in. wide, the three bottom ones being ¼ in. thick and the top one ⅛ in. thick. The discs are steel lading band anchors welded to side posts. The lining is said to require no maintenance. *Reynolds Metals Co., Dept. RLC, Richmond 18, Va.*

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## Fiber-Glass Insulation

Transulite is a fiber-glass insulation bonded with a new thermosetting resin designed to meet the severe moisture problems of the refrigerated transportation industry. After a test of 14 days in a humidity cabinet, such as used for refrigerator cars, total moisture pick-up by absorption and adsorption combined, was said to be below the maximum permitted by the specifications.

The insulation is lightweight, and is said to offer maximum resistance to sagging or settling. Its inorganic glass fibers will not burn, rot or sustain rodents or vermin. *Johns-Manville, Dept. RLC, 22 E. 40th st., New York 16.*

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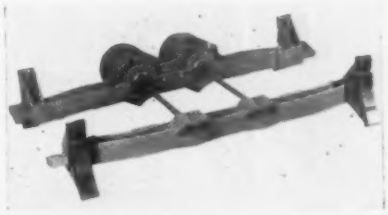

## Freight-Car Brake Units

The Wabcopac is a simplified and compact design of brake unit, one of which is applied to each freight-car truck. Each unit replaces a multiplicity of parts on conventional cars, including such items as the brake cylinder, force multiplying levers, pull rods, fulcrum pins and brackets, brake beams and brake heads. The number of parts are reduced from 62 to 35 with a weight saving of 300 lb per car set. The unit uses the Cobra brake shoe and does not require a slack adjuster or manual slack adjustment during shoe life.

The units are made in three sizes corresponding with the three conventional freight car axle sizes. The size suitable for 169,000 lb axle load has been in service since December 1958 between Cedar Rapids, Iowa, and Pittsburgh, Pa., on WCLX Car No. 2799, accumulating approximately 20,000 miles. *Westinghouse Air Brake Co., Air Brake Division, Dept. RLC, Wilmerding, Pa.*

(*Turn to page 18*)

## PROVEN BY MILLIONS OF MILES...KEEPS ENGINES CLEANER!

A routine engine check between oil change intervals will give you an indication of the superior performance of Diol RD. Oil screens are clean. Oil coolers are free from sludge and contamination that restrict flow. Diol RD stands up to heat and oxidation.

Millions of miles of day-to-day service have proved Diol RD gives longer life to rings, pistons, bearings and other moving parts. Diol RD contains special detergent additives that reduce carbon and varnish accumulations that cause ring breakage and premature wear. Anti-wear additives, designed for high-output service, protect heavily loaded parts against friction and scoring. And because Diol RD additives remain effective after long periods of service, normal oil make-up is sufficient to maintain its outstanding lubrication action.

Technical assistance is readily available through your Esso representative. For more information, write: Railroad Sales Division, Esso Standard Oil Co., 15 West 51st Street, New York 19, N. Y.

Esso

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Every diesel relies on various liquids and air for its operation. An established supplier to the railroad field, Air-Maze Corporation has an engineered filter to clean the respective liquids and air, thoroughly and efficiently.

For details, write for bulletins or contact your locomotive builder.

**Oil Bath Filter** utilizes proved oil bath principle for efficient removal of objectionable dirt particles.

## Engine Air Intake Filters

**Panelbath Filter** provides effective dirt-removal by a self-wetting action. Replaces conventional panel filters – oil-wetted or centrifugal types.

## Lube Oil Strainer

For road use and engine break-in. Furnished in a variety of elements, sizes and degrees of filtration for every type of locomotive application.

## Spark Arrester

Utilizes principle of centrifuging incandescent particles to reduce particle size, which when exhausted are quickly extinguished. Kits available for conversion of present manifold.

MEMBER

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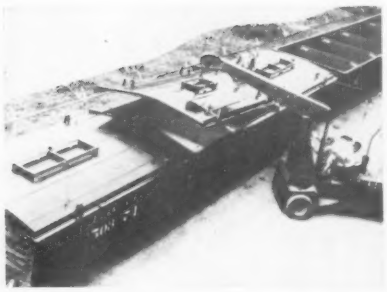
# WHAT'S NEW IN EQUIPMENT—*(Continued from page 15)*



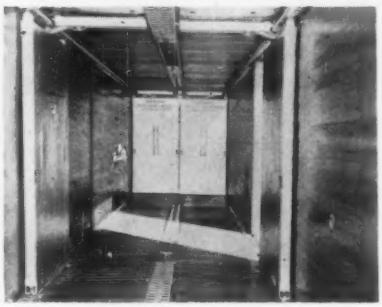
## Gondola Roof and Bulkheads

The Youngstown steel gondola roof is made in three removable sections per car set and fits any standard width, giving weather protection for steel sheets and coils. It is of beaded construction, curved for added strength and stiffness. The sections, which permit partial loading, fit flat across the bulb channel for positioning by center pins. A specially developed swing-out locking device secures the covers. Special Z-members around the roof edges can be changed for additional roof height where gondolas with walls lower than the AISI 48-in. minimum height are used. Larger coils can be loaded without hitting the inside ceiling.

Overlapping lips on the center section roof fit over the adjoining end sections. The sections are removable with overhead or trackside cranes using slings, chains or sheet lifters. Special steel brackets at the roof edges permit stacking for storing. Catwalks and the new Manway and inspection doors are optional equipment.

The Rollok bulkhead for use with the three-section roof is positive locking and removable. A standard car set consists of four bulkheads suspended on eccentric rollers which, in turn, roll on Z-section tracks the full length of the car. Additional bulkheads can be installed if desired. Locking holes are spaced continuously along the section to accommodate the casehardened oversize locking pins. A swivel crank locks pins in place when bulkhead is in desired position; a handle on the roller cam shaft is swung from front to back, and the bulkhead rests on the Z-section, preserving the roller.

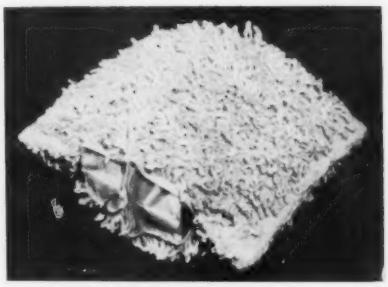
Applications of the roof and bulkhead have been made on the Erie and the Baltimore & Ohio. The Nickel Plate and the Santa Fe are applying the bulkheads. *Youngstown Steel Car Corp., Dept. RLC, Niles, Ohio.*



## Load Divider

Equipco load dividers are mounted on a pivot-type hanger which rolls on tracks the length of the car. They are equipped with ceiling and floor keepers and spring-loaded lock bars, and can be locked in place flat against the sides or ends of the car. A single retractable handle in each divider makes it easy to position and lock them at almost any spot in the car. According to the Equipment Specialties Division, which has just completed a coast-to-coast test, the dividers do not interfere with refrigeration. There is no metal-to-metal contact with the car and no loss of refrigeration efficiency.

The dividers, of high-tensile steel, have smooth surfaces to load against. They are permanently mounted and can be used with mixed loads—both perishable and dry. *Equipment Specialties Division of Union Asbestos & Rubber Co., Dept. RLC, 332 S. Michigan ave., Chicago 4.*



## Journal Lubricator

A "Life-Time" chenille looping process has been developed for the Flo-Pak journal lubricator which is now undergoing test at the AAR laboratory. The process locks each continuous loop on the underside of the base cloth, away from the journal. According to the manufacturer, journal wear cannot cause loops to pull out and the type of lock stitch measureably increases the oil wicking rate as compared to ordinary chenille loops. The pad surface remains soft.

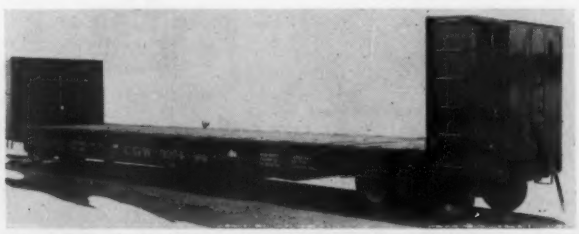
The resilient core material of neoprene foam is so held in place that collar and fillet wear on the pad cannot cause the cores to dislodge, thereby increasing the number of pads which are reusable after renovation. The base cloth is double thickness in the areas contacted by the collar and fillet. *Miller Lubricator Co., Dept. RLC, Winona, Minn.*

## Gas Powered Lift Trucks

A new line of gas-powered lift trucks is bein introduced in 3,000-, 4,000- and 5,000-lb capacity models, both in cushion and pneumatic tire types. An automatic torque transmission is standard in all to eliminate manual gear changing. The cushion tire truck uses a single-speed-range constant mesh type, and the pneumatic tire trucks

*(Continued on page 37)*

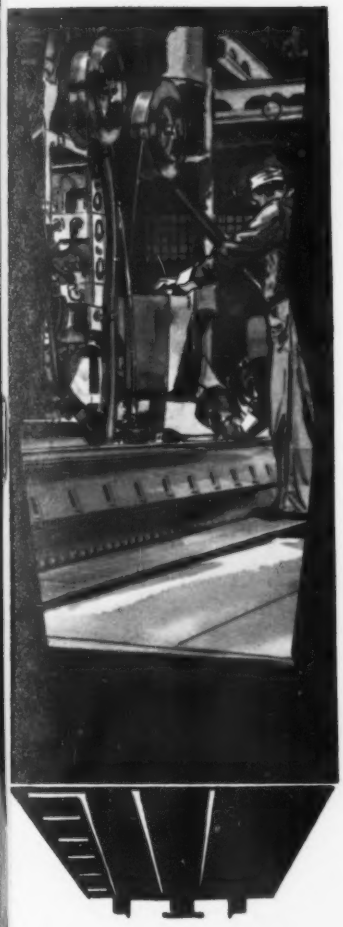
**This domeless tank car, built by General American, has a capacity of 20,000 gal. It is equipped with interior heater coils and 100-ton trucks. For specialized commodities, insulation may be applied, or, in the case of liquified gases, the cars can be constructed to various pressure specifications.**

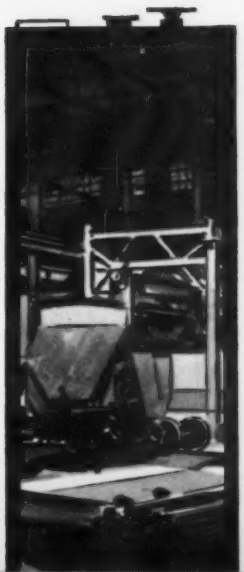


**This 50-ton bulkhead flat car, built by Thrall Car, is 53 ft 6 in. over end sills and 48 ft 6 in. between bulkhead faces. Heavy reinforcing plates are welded and riveted to the inside and outside of each side-sill web and to the outside of each center-sill beam. The bolster cover plate is over 6 ft wide longitudinally of the car.**

# *we're going like*

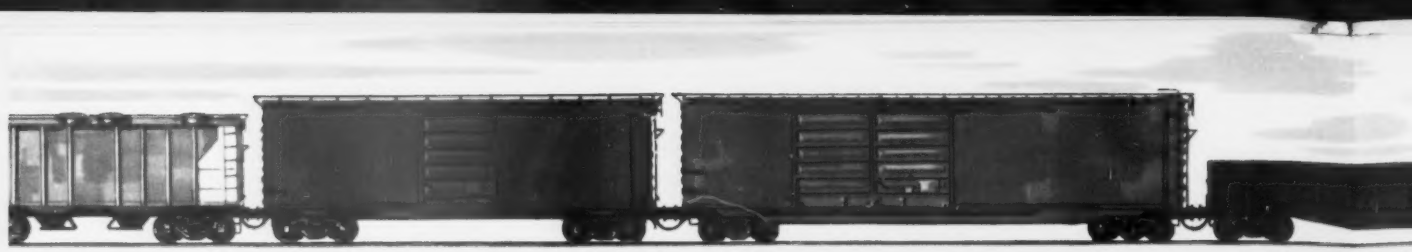
# '60

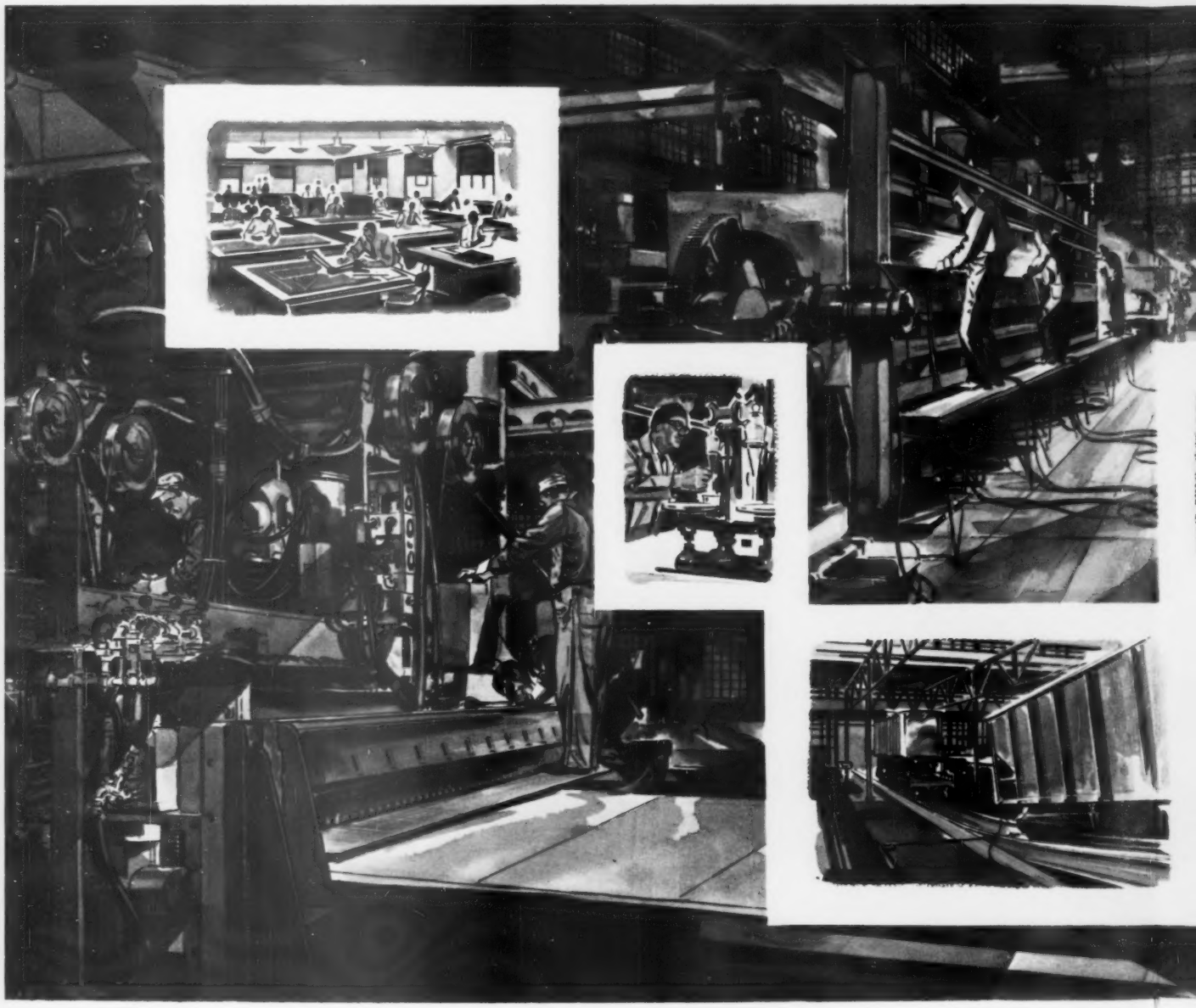




WHY LIKE '60? Just take a look at modern railroading and the pace it sets. Here's the industry that put the muscle of modern diesel power to work in a big way. An industry that creates and thrives on innovations such as: radar controlled automatic yards, highway trailer movement on flat cars, radio-telephone train communications, automated handling of LCL freight, freight schedules that challenge passenger movements.

Pullman-Standard long ago recognized that keeping pace with this vigorous industry required a parallel program of company growth and development. A program that would *anticipate* the changing needs and demands of rail carriers.





## *The goal, the '60s . . . achievement, '59*

Thirteen years ago, Pullman-Standard set company goals that would pace rail industry growth. The mid-60s were the target years for the complete evolution of:

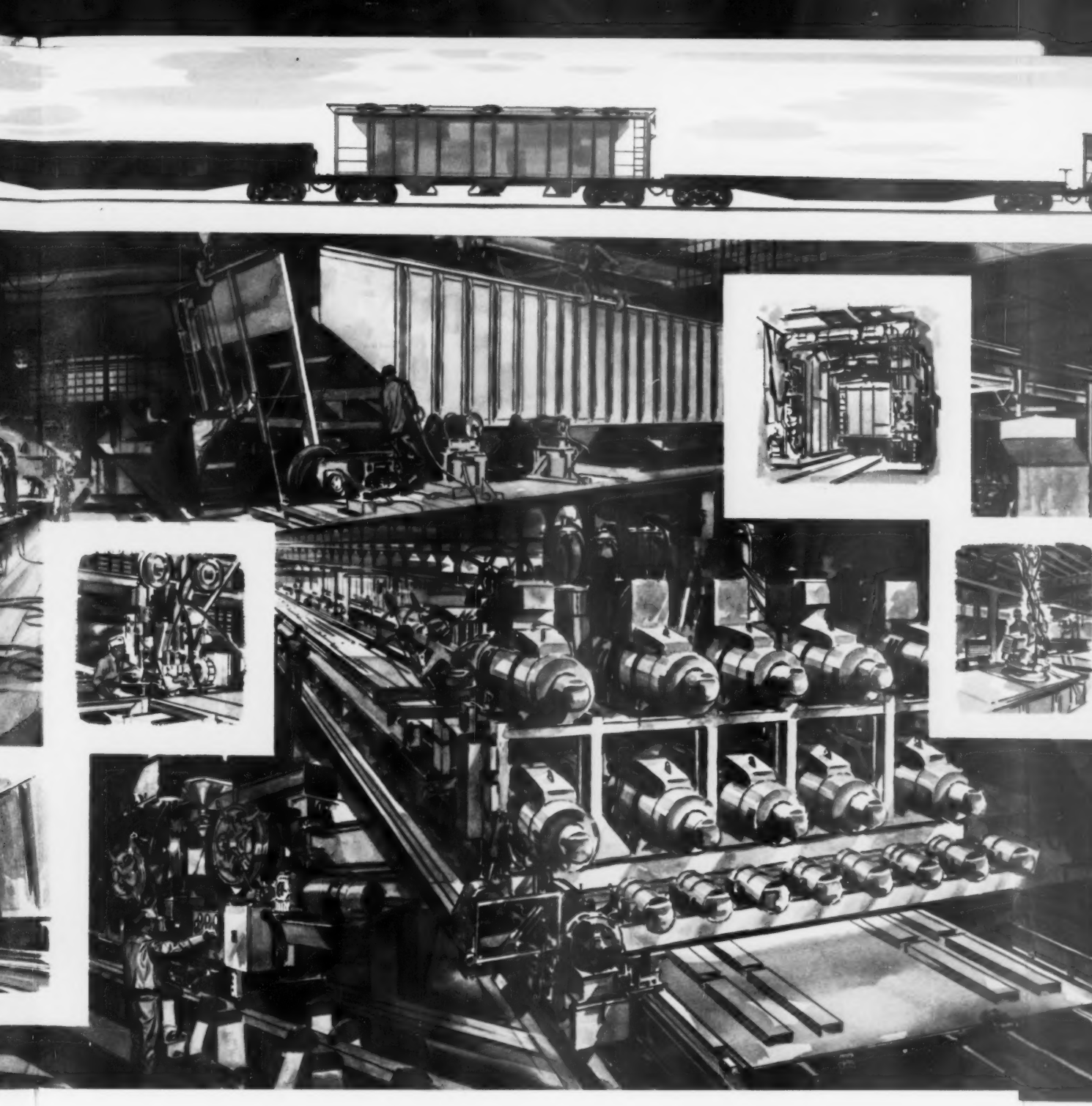
ENGINEERING SKILLS that were tuned—and would stay tuned—to industry advancement.

MANUFACTURING FACILITIES—tools and plants—designed to capitalize on the many inherent advantages of modern mass production methods and get full value from product standardization.

BOTH NEW AND IMPROVED PRODUCTS—more useful products—the result of an intimate knowledge of user needs and a company-wide interchange of ideas.

RESEARCH AND DEVELOPMENT activities that employ the most advanced proving facilities in a continuing program of product and materials testing.

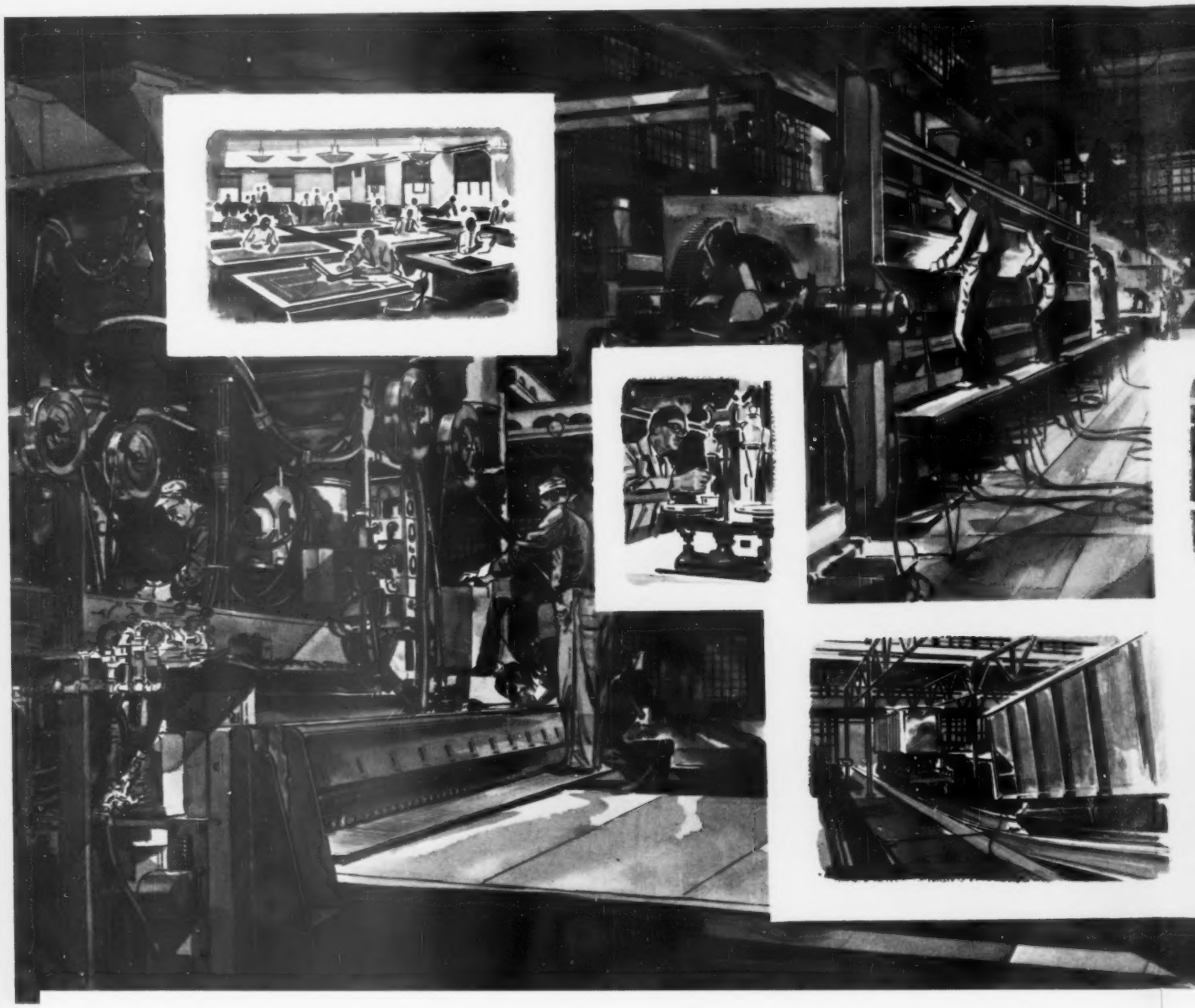
A TEAM OF FIELD ANALYSTS responsible for the continuing study and evaluation of Pullman-Standard and competitive products in service. Objective: to confirm product strengths and expose undesirable characteristics so that they may be eliminated.



Today, thanks to the stimulation of fast growing rail road needs and all-out effort of everyone at Pullman-Standard, we are proud to announce the achievement of these goals far in advance of our calendar target. In 1959, we're going like '60.

This achievement means that *today*, in these significant hours of rail history, Pullman-Standard is able to provide advanced products, produced through truly modern manufacturing facilities . . . a full line of standardized railroad products that offer the greatest possible economy in operation year after year . . . sold and serviced by a skilled and knowledgeable team of Pullman-Standard representatives.

The complete story of the full line of P-S freight car products and the design, engineering, manufacturing and service advances available to you through Pullman-Standard are outlined in the following pages. Read through them . . . find out how Pullman-Standard products can produce even greater benefits for your railroad now that we're going like '60.



# Engineering

*. . . authors of standardization*

When freight car standardization was conceived by Pullman-Standard, everyone recognized it held great promise. But, still, it was a sort of abstraction. Giving it today's working form called for considerable genius, knowledge and rare creative qualities.

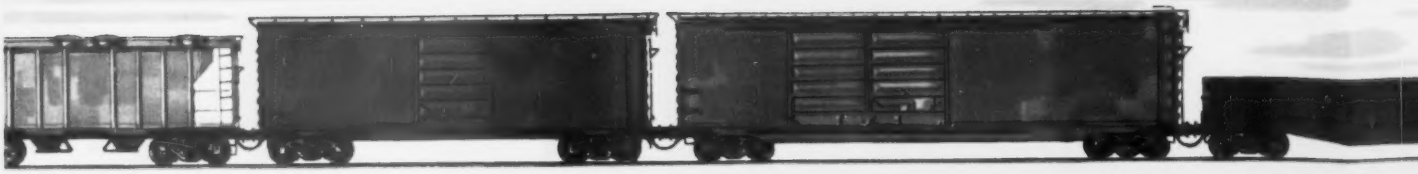
This is because standardization is not simply the building of look-alikes. It is far more than that. It's first a thousand engineering problems of physics, metallurgy, mathematics and chemistry. It even requires a

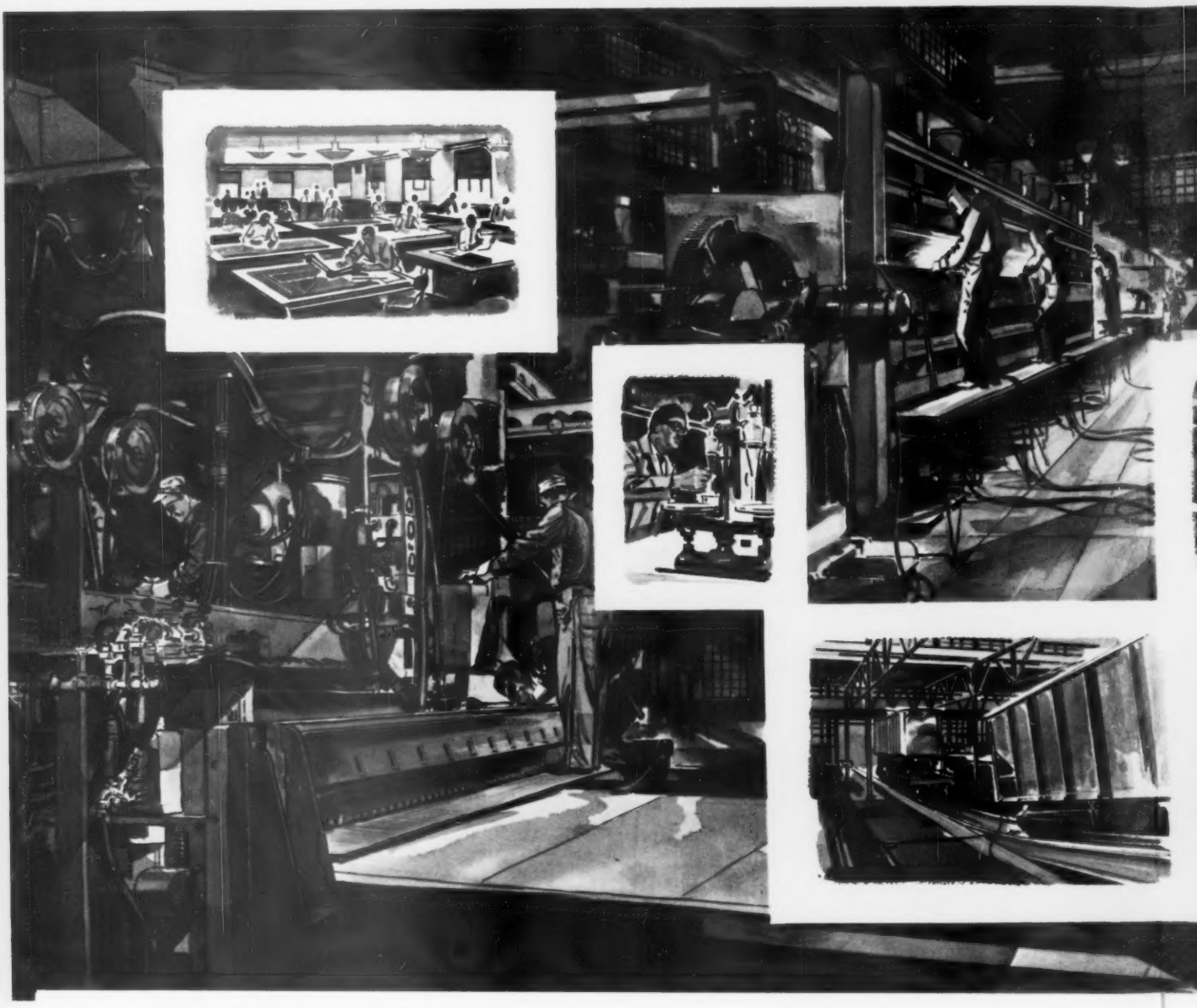
good understanding of what America's climates can do to steel and paint.

But that's not enough. Just to complicate it a little more, the solutions to all these problems must be engineered into mass produced products that will serve the diverse needs of all our railroads and all of their customers, regardless of climate, lading or service demands.

Thanks to a long range recruiting and training program, we have the engineering talent to handle all these problems and more. Young, up-and-coming engineers that offer their drive and, many times, a fresh, new slant. And there are mature leaders to hold a steadying hand on the reins and to contribute their accumulated knowledge of your rolling stock requirements—versatility, durability, economy—along with a long and enviable history of carbuilding design.

Authorship of standardization, another reason why . . . in '59, Pullman-Standard is going like '60.





# Manufacturing and Expansion

*. . . craftsmanship and capability*

Even the best design can fade into a so-so performer if the builder lacks the tools, the skills and the capacity to reproduce it.

Capacity is the result of planned growth through capital investment. It is an elementary precept of business, but sometimes it is neglected. When it is, it is disastrous from everyone's point of view.

The Pullman-Standard program of development planned and provided for a continuing flow of capital into our plants. The tools of carbuilding—jigs, fix-

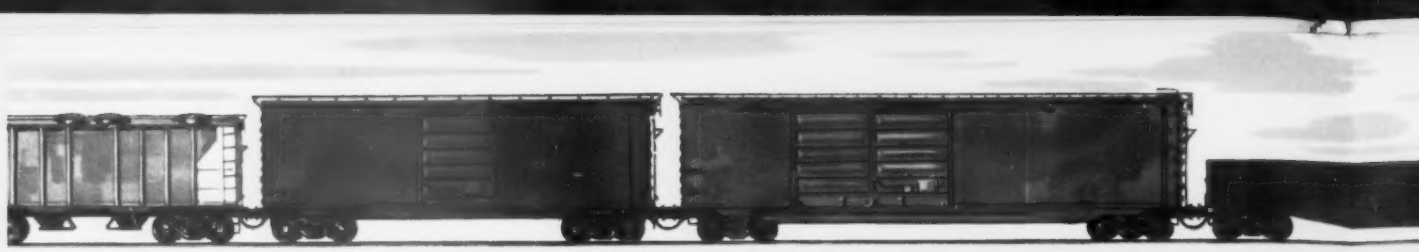
tures, specialized welding equipment—are of the most modern design and capability. And you can be sure that they're kept that way.

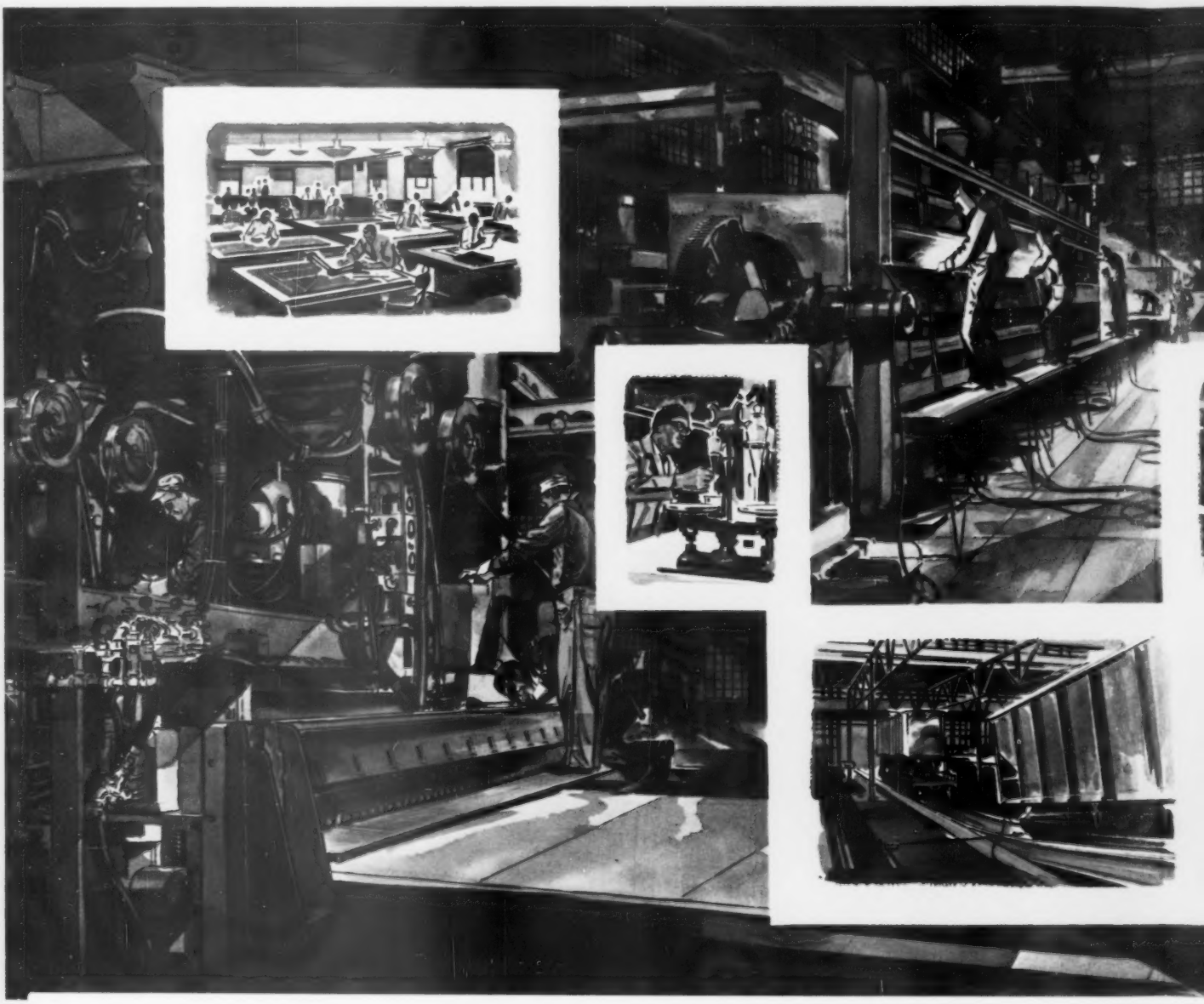
Our large carbuilding plants have set the standards for up-to-date materials and production flow. And they are constantly being improved, expanded, upgraded.

During the past few years, Pullman-Standard has invested millions of dollars to create new plant capacity, and to provide tools, processes and plant facilities in tune with the progress of the railroad industry.

Of course, the personal skills of manufacturing are equally important. The development of these skills must always be an active effort as it has been throughout our carbuilding history. And so, through improved plant and facilities and a constant program of training and education, Pullman-Standard helps the craftsman —the man who builds—improve his capability and develop new skills.

Capability and craftsmanship, more reasons why . . . in '59 Pullman-Standard is going like '60.





# Full Product Line

## *. . . the harvest of standardization*

In 1947, the first fruit of our long range development program rolled off the assembly line and out into service on the Lehigh Valley. It was the first of a long line of standardized freight cars, the Pullman-Standard PS-1 Box Car. . .

Today, Pullman-Standard standardization is full line standardization. In freight rolling stock, five basic cars are now available: The PS-1 Box Car, PS-2 Covered Hopper, PS-3 Open Hopper, PS-4 Flat Car and the newest member of the line, the PS-5 Gondola.

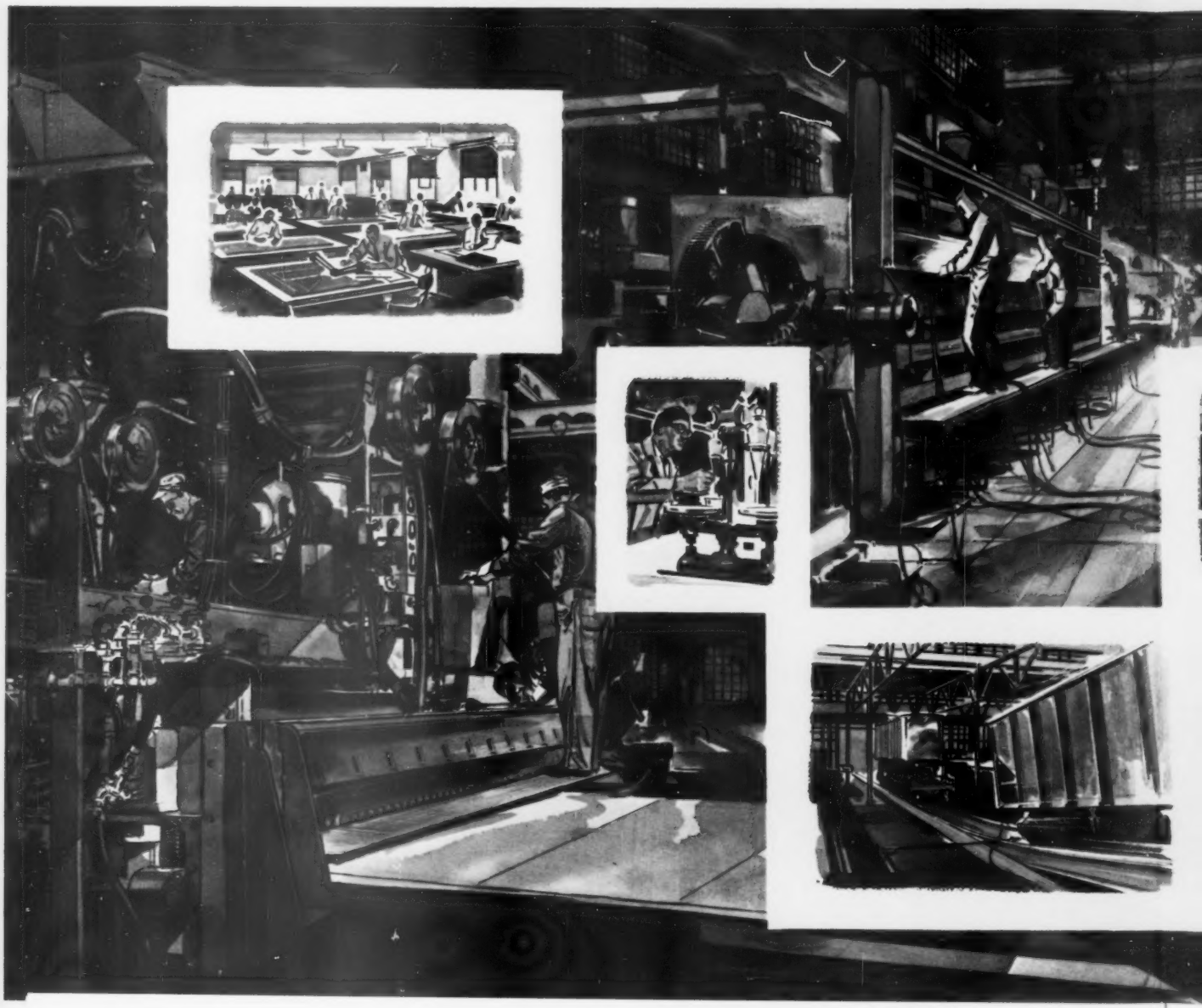
Thanks to P-S *Flexible* Standardization, these basic cars are offered in variations—variations in lengths, capacities, accessories—to suit any railroad need. In addition, other cars—the 85 foot flat car for example—

are available. All are built to offer exceptional durability, versatility and economy.

Pullman-Standard car parts and specialties are standardized, too. Each part—from underframes to roofs—is severely tested before it joins the P-S line. All are produced under the highest quality standards and tightest tolerances to insure interchangeability. And deliveries are tailored to your building schedule. No wonder Pullman-Standard parts customers buy confidently and find they build, rebuild and repair their freight rolling stock with greater ease and economy.

Rounding out P-S products for progress is the advanced line of Lading Protection Products—the P-S Compartmentizer and P-S Cushion Underframe. Sharply reduced damage claims, improved customer goodwill and important shipper-consignee savings in labor and material are just three of the measurable benefits these products are producing for many prominent shippers and major railroads.

The Pullman-Standard line of advanced products for progress is another reason why . . . in '59 Pullman-Standard is going like '60.



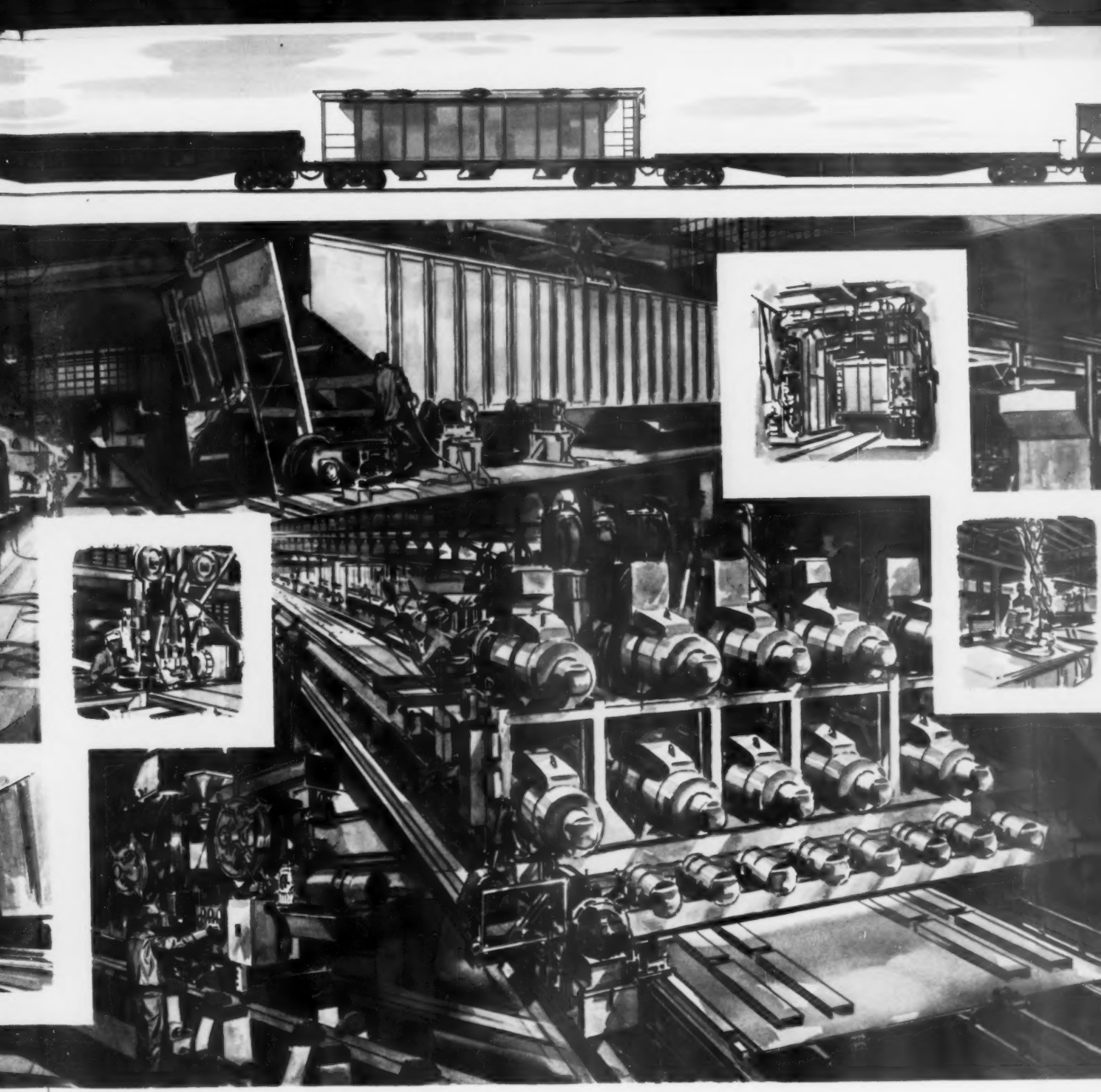
# Research and Development

*... the search for superiority*

The engineers and scientists of our Research and Development staff are mighty hard to please. They probe deeply into every material, process and part before it can be certified for use in P-S products.

Raw materials are tested from every quarter. Chemistry reveals their structure and composition. Physical tests strain, twist, flex and corrode. Only the best survive. Only the best go into P-S products.

Building methods get a long hard look. Welds, rivets and bolts are tested competitively. Whether a forging or casting is selected becomes a matter of proved superiority, not favoritism.



Every prospective part suffers the same fate. Tests are brutal. Parts are strained beyond endurance; flexed and flexed again through thousands of cycles; subjected to immense forces. And every part must prove itself under extremes of temperature, stress and impact. Weakness is sought out, then overcome.

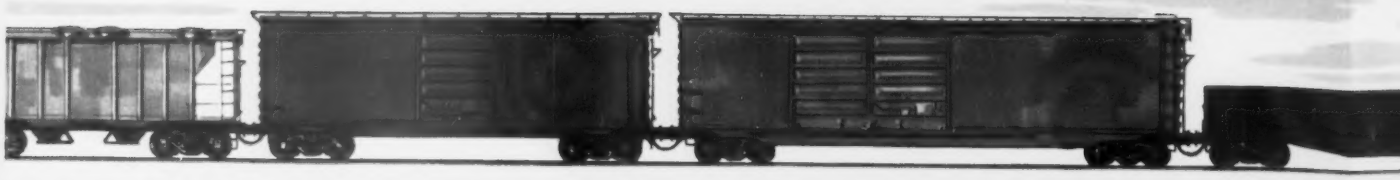
Even test conditions are tested to be certain that they duplicate the widest range of service conditions.

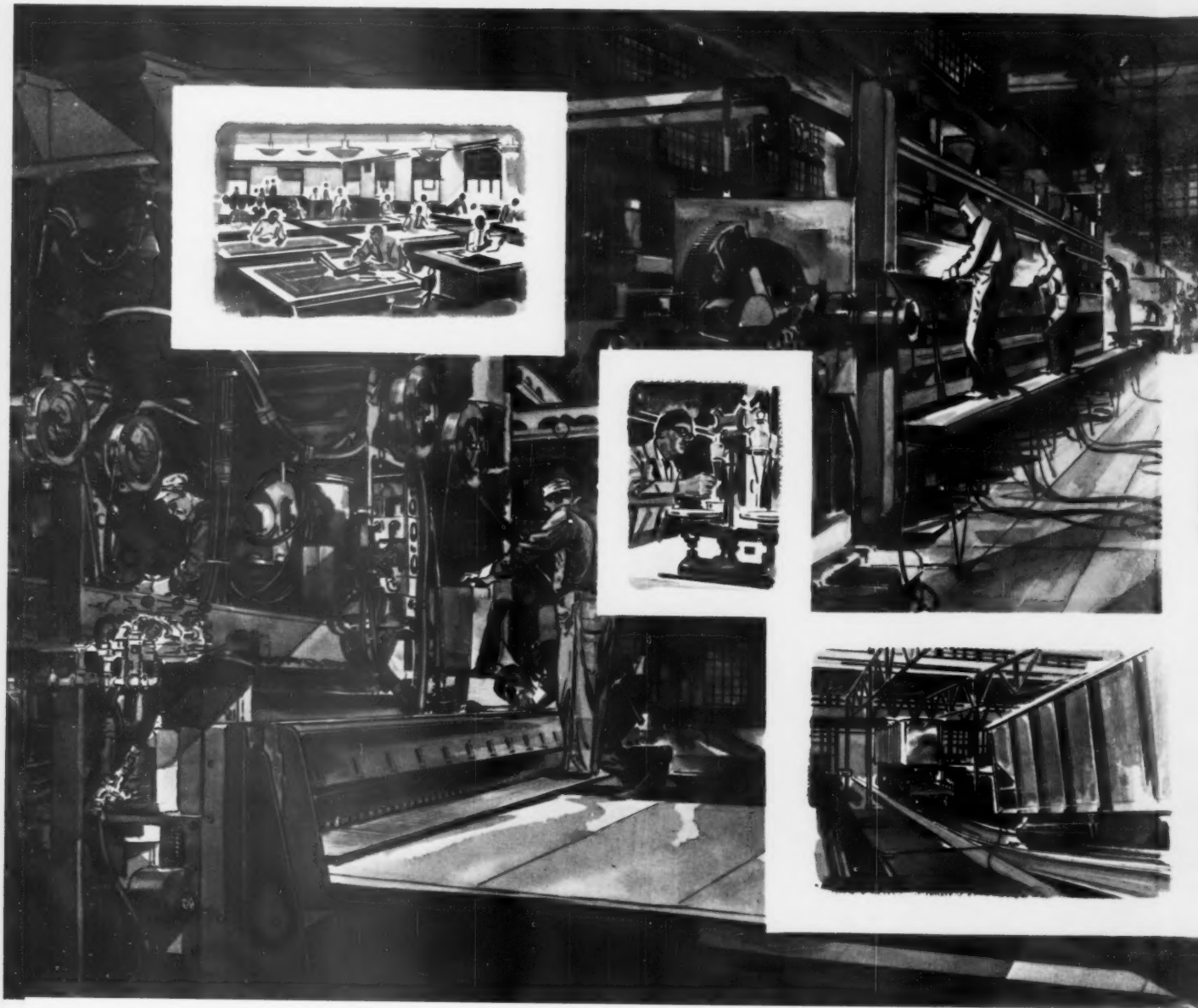
All this before we can even build the prototype.

When a prototype car is completed, under R & D direction, it gets the same tough treatment. Shake down tests bully and batter the car for hundreds of hours. Massive machines pound and twist years of service into hours. Impact test forces reach hundreds of thousands of pounds at speeds beyond expected service use.

Accelerometers, strain gauges, velocity pickups, dynamometers feed signals through an oscillograph that makes a visual record of the car's internal workings . . . finds hidden bugs.

Then after the bugs are ironed out and a production car built the entire test procedure is repeated. Only the best products survive. Only the best go into service on The Great American Railway System. Another reason why . . . in '59 Pullman-Standard is going like '60.



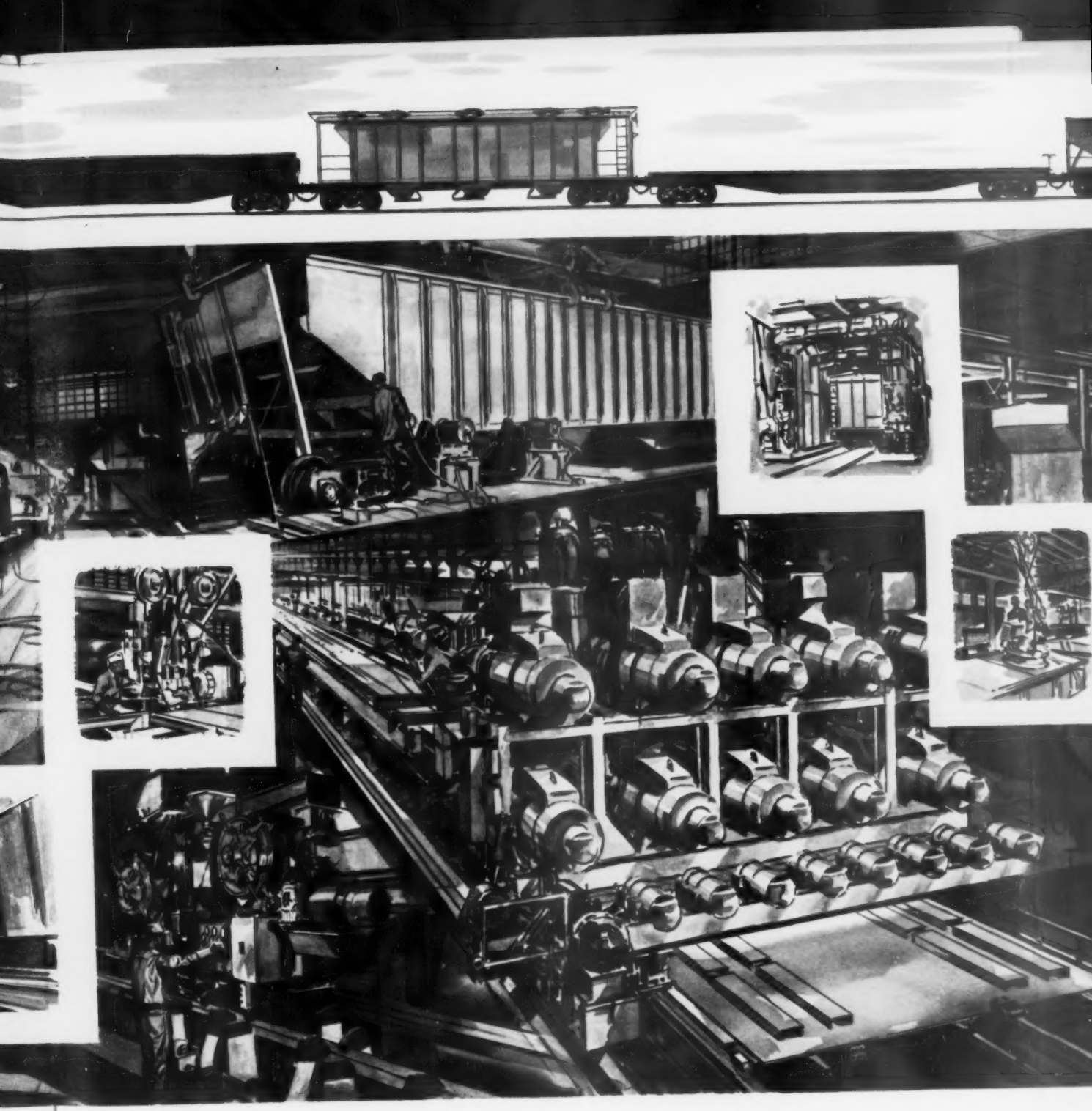


# Field Analysis

*. . . the road show critics*

We don't believe that our job is done once a Pullman-Standard car rolls off the assembly line. On the contrary, when they go into your service, Pullman-Standard is just beginning another vital step that we call *Field Analysis.*

The members of our specialized and skilled Field Analysis-Field Service team criss-cross the country—travel over 100,000 miles each year making critical performance studies of rolling stock. The shops, yards, sidings and mainlines of the Great American Railway System are the proving grounds they work. They crawl under, climb into, over and around P-S cars in service.



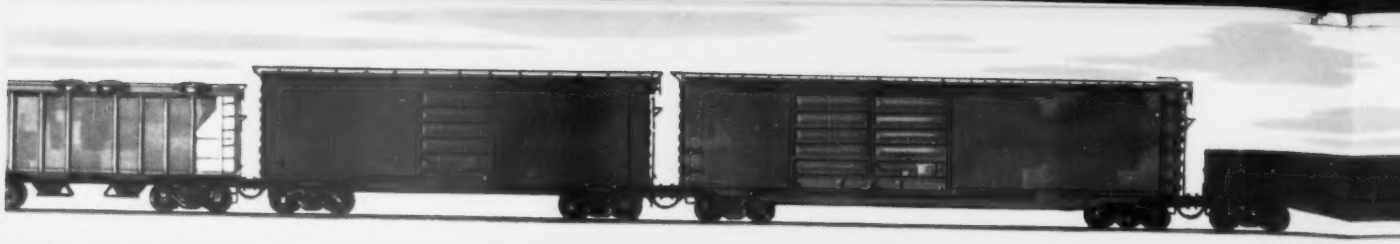
Car performance is observed, investigated, measured and reported.

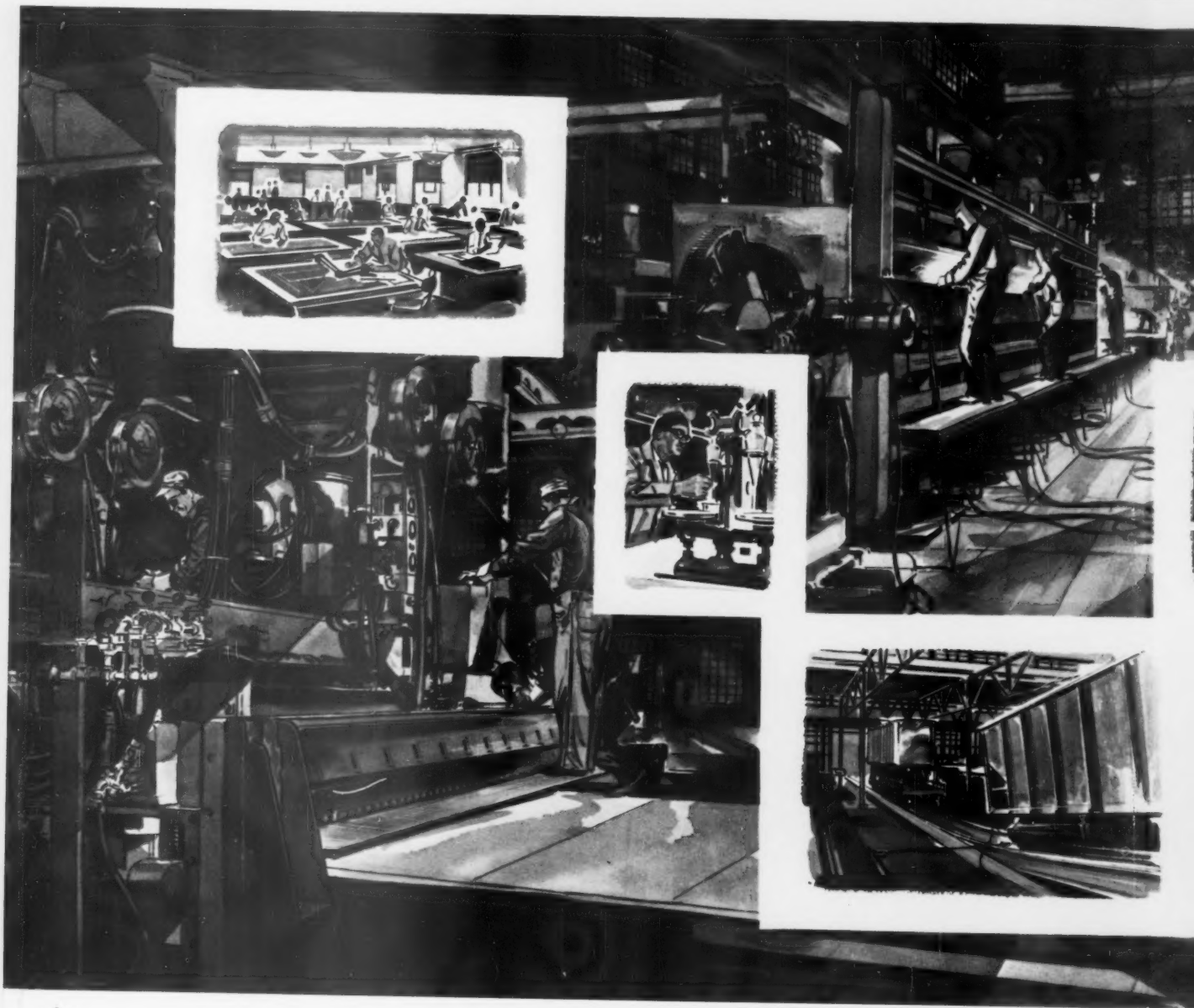
They spend an important part of their time just being good listeners, too. They exchange ideas, comments and suggestions with the men in the shops, mechanical departments—in fact, with all railroad departments and men, top to bottom.

It's in this way that we are able to get a truly candid evaluation of car performance. Weakness, if it exists, is uncovered. Strong points are confirmed. New and old equipment can be probed to see how well each is doing its job. And most important, it is here that we gain a truly intimate understanding, a broad knowledge of your railroading problems.

The vital on-the-spot performance reports and customer statements that result form the foundation for a constant flow of product advancement. These extra steps by our Field Analysts make sure the P-S rolling stock is always *ahead* in design and engineering . . . offering more performance benefits, newer features, trouble-free service and greater economy year after year to America's railroads.

Pullman-Standard road show critics . . . another reason why . . . in '59 Pullman-Standard is going like '60.





# Sales

## *. . . the Jacks (and Masters) of all trades*

In our eyes—and your's too, no doubt—a salesman has to have more than a glib knowledge of the product. He must also have a deep, practical understanding of your railroading problems and your shipper concerns. Only then can he see the products he offers as you see them: as possible solutions to these problems.

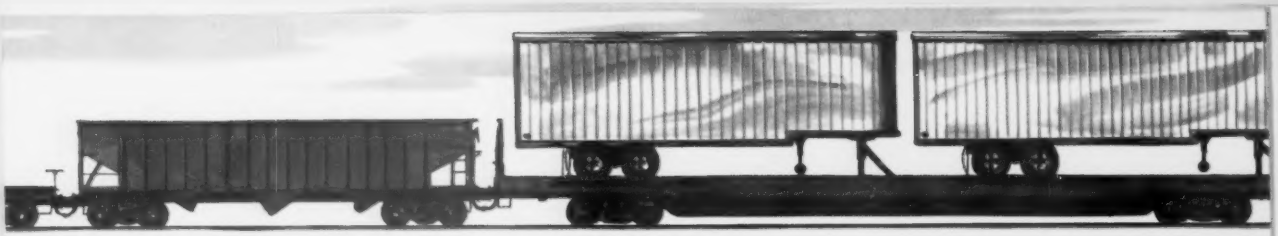
And because Pullman-Standard representatives must be expert in the full line of P-S products—freight cars, freight car parts and lading protection devices—you can use their rare ambivalence in working out practically any rolling stock problem you face.

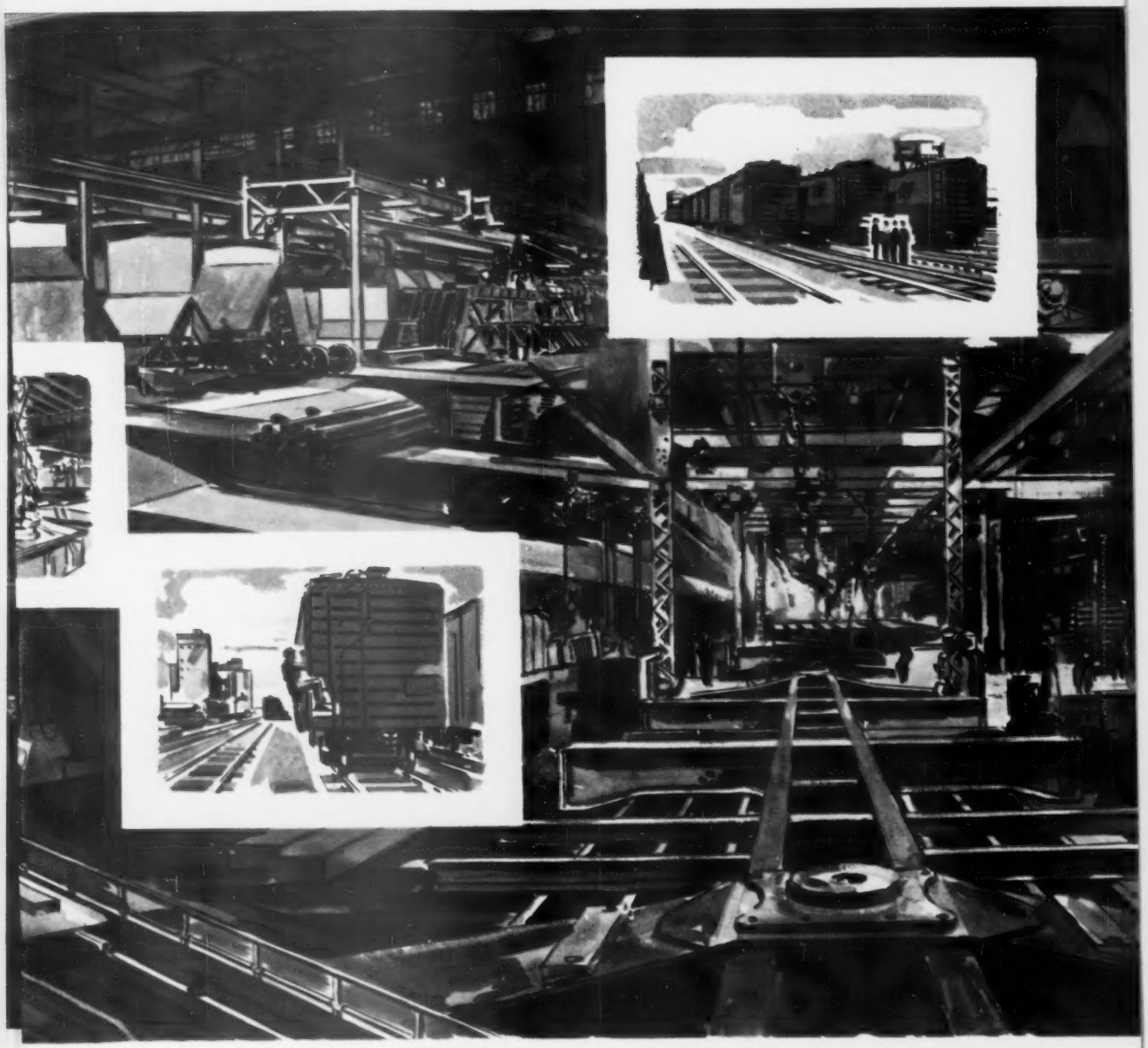
Going into a rebuilding program? Your Pullman-

Standard representative has a full line of car parts and components—roofs, ends, sides, underframes, doors, floors—practically everything you need. This single supply source means better timed deliveries, components shipped to fit your building schedule. Call your P-S representative . . . he's got the knowledge and products to help you solve the problem.

Need new equipment? Equipment that's highly versatile and practically maintenance-free? Rolling stock that has an extra quota of durability and low first cost? Ask your P-S representative how Standardized Freight Cars can solve any of these problems and more. Got a shipper that wants—no, demands—better in-transit protection for his products? Your P-S representative is a specialist in lading protection problems. And he has the products and the knowledge that will provide the most effective solution.

When you want to feel certain—and have the evidence to back it up—that your buying decision is the best one you can make, call in your Pullman-Standard representative. Let him show you why P-S performance-proved products are the most practical and economical answer to your purchasing problem. He's another reason why . . . in '59 Pullman-Standard is going like '60.





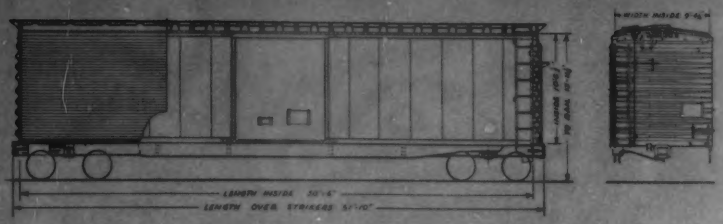
*we're going*

*like* '60 *at*

PULLMAN-STANDARD

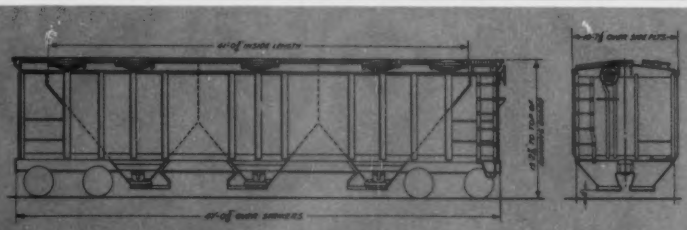
# P-S STANDARDIZED PRODUCTS

## PS-1



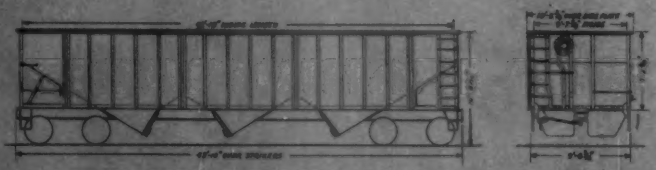
PS-1 STANDARDIZED BOX CAR—Available in 40 or 50 foot lengths, insulated or standard interiors, a choice of door types and sizes, floors and other optional accessories.

## PS-2



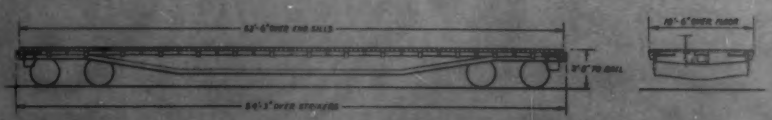
PS-2 STANDARDIZED COVERED HOPPER—Featuring heavy-duty, all-welded construction—available in four capacities: 2010, 2933, 3219 and 3510 cubic feet.

## PS-3



PS-3 STANDARDIZED HOPPER CAR—Offered in the 70 ton 3-hopper model.

## PS-4

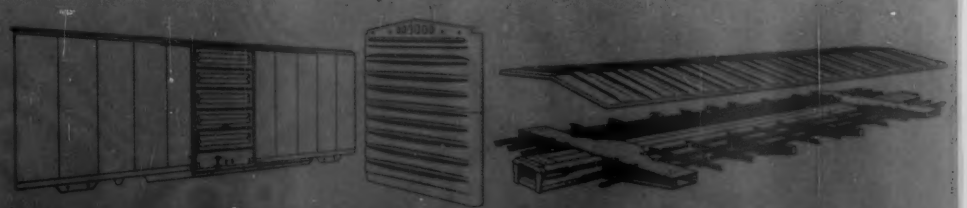


PS-4 STANDARDIZED FLAT CAR—In 50 and 70 ton capacities, 53, 56 and 60 foot lengths.

## PS-5

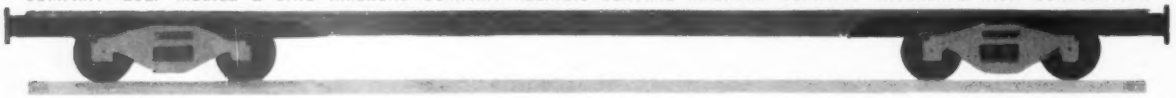
PS-5 STANDARDIZED GONDOLA—In 70 ton capacity and 52 or 60 foot lengths.

## Parts



P-S STANDARDIZED PARTS—Each is the product of the same high quality mass production methods as those used in P-S Standardized Freight Car building.

AKRON, CANTON & YOUNGSTOWN RAILROAD COMPANY • ALABAMA POWER COMPANY • AMERICAN SMELTING & REFINING COMPANY
AMERICAN SUGAR REFINERY COMPANY • THE ANN ARBOR RAILROAD COMPANY • THE ATCHISON, TOPEKA & SANTA FE RAILWAY SYSTEM
ATLANTA & WEST POINT RAILROAD COMPANY • THE BALTIMORE & OHIO RAILROAD COMPANY • BESSEMER & LAKE ERIE RAILROAD COMPANY
BETHLEHEM STEEL COMPANY • BIRMINGHAM SOUTHERN RAILROAD COMPANY • BOSTON & MAINE RAILROAD • BUFFALO CREEK RAILROAD
CANADIAN GENERAL TRANSIT COMPANY • CANADIAN NATIONAL RAILWAYS • CANADIAN PACIFIC RAILWAY COMPANY • CENTRAL OF GEORGIA
RAILWAY COMPANY • THE CENTRAL RAILROAD COMPANY OF NEW JERSEY • CENTRAL SOYA COMPANY, INC. • THE CHESAPEAKE & OHIO
RAILWAY COMPANY • CHICAGO & EASTERN ILLINOIS RAILROAD COMPANY • CHICAGO & ILLINOIS MIDLAND RAILWAY COMPANY • CHICAGO &
NORTH WESTERN RAILWAY COMPANY • CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY • CHICAGO GREAT WESTERN RAILWAY COMPANY
CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD COMPANY • CHICAGO, ROCK ISLAND & PACIFIC RAILROAD COMPANY • CHICAGO, ST. PAUL,
MINNEAPOLIS & OMAHA RAILWAY COMPANY • CITY OF CHICAGO • CLINCHFIELD RAILROAD COMPANY • COLORADO & WYOMING RAILWAY
COMPANY • COLUMBUS & GREENVILLE RAILWAY COMPANY • J. C. CORRIGAN COMPANY • COPPER RANGE RAILROAD COMPANY • DELAWARE &
HUDSON RAILROAD CORPORATION • THE DELAWARE, LACKAWANNA & WESTERN RAILROAD COMPANY • THE DENVER & RIO GRANDE WESTERN
RAILROAD COMPANY • DETROIT, TOLEDO & IRONTON RAILROAD COMPANY • DULUTH, MISSABE & IRON RANGE RAILWAY COMPANY • DULUTH
SOUTH SHORE & ATLANTIC RAILROAD COMPANY • ELGIN, JOLIET & EASTERN RAILWAY COMPANY • ERIE RAILROAD COMPANY • ESCANABA
& LAKE SUPERIOR RAILROAD COMPANY • FERROCARRIL DEL PACIFICO • FLORIDA EAST COAST RAILWAY COMPANY • FT. DODGE, DES MOINES
& SOUTHERN RAILWAY COMPANY • GENERAL AMERICAN TRANSPORATION CORPORATION • GEORGIA & FLORIDA RAILROAD • GEORGIA
RAILROAD • GRAND TRUNK WESTERN RAILROAD COMPANY • GREAT NORTHERN RAILWAY COMPANY • GREEN BAY & WESTERN RAILROAD
COMPANY • GULF MOBILE & OHIO RAILROAD COMPANY • ILLINOIS CENTRAL RAILROAD COMPANY • INTERLAKE IRON CORPORATION



# In the 13 Years of P-S Standardization

*113 leading carriers have purchased over 120,000 Pullman-Standard standardized freight cars*

The most impressive demonstration of the wide-spread acceptance granted P-S standardized products is this line-up of Pullman-Standard customers. Reads like the who's-who of American railroading.

And it's not a misplaced confidence. Not an uneasy one either, because these railroads have found they can expect—and will get—consistent quality, dependable performance, measurable economies and pace-setting design when they specify Pullman-Standard products.

Reason why? Pullman-Standard's planned progress—the provision for growth and development that keeps us ahead in every way . . . keeps us going like '60.

## PULLMAN-STANDARD

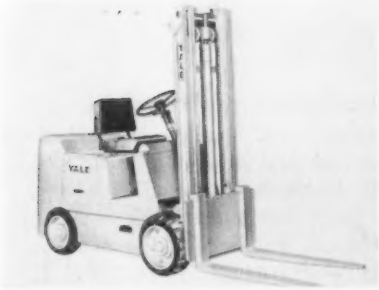
A DIVISION OF PULLMAN INCORPORATED

**200 SOUTH MICHIGAN AVENUE, CHICAGO 4, ILLINOIS**

BIRMINGHAM • PITTSBURGH • NEW YORK

J. C. Fennelly Co., San Francisco Representative

THE KANSAS CITY SOUTHERN RAILWAY COMPANY • LAKE SUPERIOR & ISHPEMING RAILROAD COMPANY • LANCASTER & CHESTER RAILWAY COMPANY • THE LASALLE & BUREAU COUNTY RAILROAD COMPANY • LEHIGH & NEW ENGLAND RAILROAD COMPANY • LEHIGH VALLEY RAILROAD COMPANY • LOUISIANA & ARKANSAS RAILWAY COMPANY • LOUISVILLE & NASHVILLE RAILROAD COMPANY • LOX EQUIPMENT COMPANY • MAGOR CAR COMPANY • MAINE CENTRAL RAILROAD COMPANY • THE MINNEAPOLIS & ST. LOUIS RAILWAY COMPANY MINNEAPOLIS, NORTHFIELD & SOUTHERN RAILWAY • MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE RAILROAD COMPANY • MISSISSIPPI CENTRAL RAILROAD COMPANY • MISSOURI-KANSAS-TEXAS LINES • MONON RAILROAD • THE NASHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY • NATIONAL RAILWAYS OF MEXICO • NATIONAL SUGAR REFINERY COMPANY • NEW JERSEY, INDIANA & ILLINOIS RAILROAD COMPANY NEW YORK CENTRAL SYSTEM • THE NEW YORK, CHICAGO & ST. LOUIS RAILROAD COMPANY • THE NEW YORK, NEW HAVEN & HARTFORD RAILROAD COMPANY • NEW YORK, SUSQUEHANNA & WESTERN RAILROAD COMPANY • NORFOLK & WESTERN RAILWAY COMPANY NORTH AMERICAN CAR CORPORATION • NORTHERN PACIFIC RAILWAY COMPANY • OLIVER IRON MINING COMPANY • THE PENNSYLVANIA RAILROAD • PHILADELPHIA QUARTZ COMPANY • THE PITTSBURGH & WEST VIRGINIA RAILWAY COMPANY • RICHMOND, FREDERICKSBURG & POTOMOC RAILROAD COMPANY • RUTLAND RAILWAY CORPORATION • ST. JOSEPH LEAD COMPANY • ST. LOUIS-SAN FRANCISCO RAILWAY COMPANY • ST. LOUIS SOUTHWESTERN RAILWAY COMPANY • SANTOS A JUNDIAI • SAVANNAH & ATLANTA RAILWAY COMPANY • SEABOARD AIR LINE RAILROAD COMPANY • SOUTHERN PACIFIC SYSTEM • SOUTHERN PERU COPPER CORPORATION SOUTHERN RAILWAY SYSTEM • TENNESSEE CENTRAL RAILWAY COMPANY • THE TEXAS-MEXICAN RAILWAY COMPANY • TOLEDO, PEORIA & WESTERN RAILROAD COMPANY • UNION PACIFIC RAILROAD • U. S. ARMY • U. S. NAVY • U. S. TRANSPORTATION CORPS • U. S. WAR DEPARTMENT • UTAH RAILWAY COMPANY • THE VIRGINIAN RAILWAY COMPANY • WABASH RAILROAD COMPANY • WESTERN MARYLAND RAILWAY COMPANY • WESTERN PACIFIC RAILROAD COMPANY • WESTERN RAILWAY OF ALABAMA • WISCONSIN CENTRAL RAILROAD COMPANY



utilize a two-speed-range transmission. The latter can be had as optional equipment on cushion tire trucks. Both transmissions are controlled by a single lever located just below the steering wheel.

The trucks have two brake pedals, one serving solely as a braking device and the other as an inching and brake unit. Both pedals are suspended. *Yale & Towne Mfg. Co., Dept. RLC, 11,000 Roosevelt Blvd., Philadephia 15.*

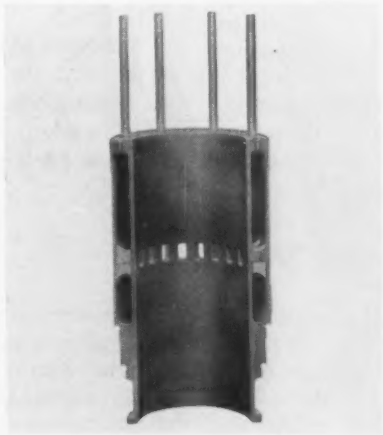
## Chromium Plated Liners

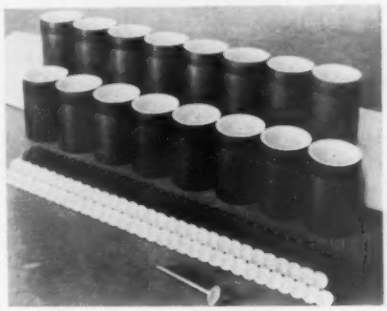
The Honeychrome-Matte finish for diesel cylinder liners is said to seat rings faster, to control lubricating oil and to give longer liner life.

The "Honeychrome" pattern is a geometric arrangement of cups etched to a controlled depth in the chromium of a cylinder wall, depending upon the thickness of the plating. The deeper cups occur in a belt extending downward several inches from the circle of top ring reversal. During engine operation, all cups become reservoirs of lubricating oil.

The "Matte" pattern is a random texture superimposed upon the entire Honeychrome formation and cylinder bore. It is microscopically toothed, serving its purpose during the initial hours of liner operation. Upon engine startup, rings bear against the toothed Matte finish of the chromium. While wear amounts to only fractions of a thousandth of an inch, it is sufficient to seat the rings and to wear away the toothed effect during the initial ring seating period. This accelerated ring seating rapidly provides control of lubrication and limits the amount of waste oil.

As the toothed effect disappears, rings become seated on the chromium, substantially lessening the wear upon both the bore and the rings under proper conditions of lubrication through the Honeycomb system of reservoir cups. The design provides approximately 94 per cent of the bore as plateau area for ring contact, while relief openings are only 6 per cent of the area. As operating hours accumulate, the system of cups does not become obliterated from wear, but remains nominally fixed in its pattern. *Chromium Corporation of America, Dept. RLC, 8701 Union ave., Cleveland 5.*





## Ceramic Coatings

Pistons, valves and cylinder heads for diesel locomotives can be coated with rare earth oxides to resist high temperatures, minimize hot spots, and promote fuel combustion. The material has been tested in railroad service (RL&C, August 1958, p 27).

The material is 50 per cent cerium oxide along with other rare earth materials. Other abrasion-and-heat-resistant compounds are available. Ease of application is insured with the Flame Ceramic automatic powder feeder and the Flame Ceramic lightweight coating torch.

The feeder is designed to deliver the extremely fine powders at a uniform rate into the oxygen stream which, in turn, delivers the powders to the torch. Feeder consists of a pressurized hopper, equipped with a screw which feeds the powder into a special carburetor and then into a series of devices

(*Continued on page 103*)

**One of 2,000 70-ton triple-hopper cars, built by ACF for the Pennsylvania under a leasing plan, will be on display. Sides are of a riveted design. Underframes and floors are of riveted welded construction. Light weight is 54,120 lb. All plates and shapes contacting lading are low-alloy, high-tensile steel. Trucks are A-3 ride-control, with 3-11/16 in. travel springs.**

**Ship-O-Matic covered hopper car, built by ACF, will be displayed for the first time. Car has Enterprise pneumatic outlets for easy unloading of dry granular or powdered materials and can be unloaded by gravity. Twin-hopper model has 2,000 cu ft capacity and triple-hopper cars can be built in 2,900, 32,200 and 3,500 cu ft sizes. All welded smooth interior can be coated if required.**

# EDITORIALS

## C. B. Peck

A man who is both a fine engineer and a good editor is a rarity. "C.B.," as he was known to his associates and friends, was both.

His formal educational record was indicative of his ability as an engineer; he graduated with honors in mechanical engineering. And those who have read the review of his career that appears elsewhere in this issue will understand his continued interest in this field. He made outstanding contributions not only to railway mechanical engineering, but also to the profession in service to the American Society of Mechanical Engineers by whom he was honored with a fellowship in 1947.

C. B. Peck had an inquiring and analytical mind. He wanted to know the how and why of everything he dealt with as an editor. "C.B." treated no subject superficially. In his more than 40 years on the staff of this publication, he handled assignments on every mechanical department subject, but he had a special interest in railway car design. "C.B." studied and analyzed thoroughly every new design before he wrote a technical description. He was aware of the fact that the railroads, depending on interchangeability, had narrowed the area in which the designer and inventor had a free hand. He recognized that the job had become less one of invention and more one of engineering.

He excelled in writing. "C.B." had a command of the language that gave his technical articles unusual color and accuracy. Those who had occasion to tailor his copy to available space were faced with a most difficult task. He covered subjects in detail, but he used no superfluous words in doing so. His copy was not easy to "cut."

It is particularly appropriate that mention be made of his interest both in the AAR Mechanical Division and the Coordinated Mechanical Association. He gave both his wholehearted support. "C.B." was particularly fond of the Coordinated Associations which meet this month at Chicago because he believed they performed an outstanding service to the railroad industry by improving the knowledge of those in attendance. With logic, he pointed out that anything that improves the man increases his value to the industry.

More than an editor and an engineer, "C.B." was a man of integrity. His associates know that he stood by his convictions regardless of business or personal influences. And he had a down-to-earth manner that put everyone at ease. Everyone admired "C.B."

## How Much Is Horsepower Worth?

A few years ago an operating man was asked what maximum horsepower was practicable for freight train operation. He replied that four 1,500-hp diesel units represented the limit since they could provide all the tractive force that drawgear could stand. This reply reflects the tenacity of the "Jim Hill" doctrine, "Cost is by the trainload and revenue by the car load".

Now things are happening that indicate that the Hill doctrine needs some modification if is to serve present-day needs. Basically it is still sound, but if rigid adherence to its tenets causes a loss of traffic or an increase of costs other than those of train operation, there is reason to believe that some changes are in order.

And there is evidence that railroad operators are aware that changes are a must. Freight trains are being operated at 60 and 70 miles an hour, not with four, but with five and more units. The extra units can not be used for starting. They can only increase train speeds and in many cases the length of trains has been shortened.

The obvious reason for high horsepower is to meet competition by providing better service. Higher road speeds as such can help, but probably not as much as the reduction of time in yards. On the other hand, shorter trains may be made up to permit the passing of some yards, and if trains could all be shorter, the time-consuming yards could be smaller and the time of cars in them be reduced. So more power and more speed would appear to offer a number of advantages.

Diesel units of 2,400 horsepower have been available for some time. Only recently, however, have units of this size been given considerable attention.

To be sure, the Union Pacific has been operating 4,500-hp. gas turbine locomotives for several years and now has new ones rated at 8,500 hp. But the UP is looked upon by others as a thing apart. Operators on other roads say, in substance, yes that is OK for the U.P. but we could not afford them on our railroad. They appreciate the advantages of power, but are still uncertain of how to get it.

It would seem here that the advocates of railroad electrification might take a leaf from the book of progress. Recent reports on the subject speak of its advantages in the form of lower locomotive maintenance costs and they wave the boogie of rising liquid fuel costs. They prepared a dozen ways to make future installations less costly than those of the past and show how to dispose of potential difficulties. The reports are technically thorough, but up to now little if anything has been said about what electric operation can do to deliver power to a train. No other form of motive power can approach the electric locomotive in delivering power to the rail. It would appear that with the railroads' growing requirements, the writers of reports might well stress this feature of electrification.

# Here's a NEW WELDING TORCH that's WATERTIGHT... built for HEAVY-DUTY SERVICE ...yet weighs only 7 OUNCES!

This new HELIARC HW-18 Hand Welding Torch weighs only 7 ounces, making it easy for you to handle, less tiring. The special one-piece water cooling channel eliminates sources of leakage. And it's made for rugged, heavy-duty service.

**YOU GET BETTER SHIELDING WITH LESS GAS**

Improved design of collet body and closer electrode fit assure uniform argon flow, without jetting or turbulence.

**GIVES YOU RUGGED SERVICE**

Torch body is Fiberglas-reinforced phenolic for greater resistance to heat and thermal shock. Handle is tough, polished plastic. Gas cups have 4 times the impact strength of ordinary cups.

**LEAKPROOF**

Molded, one-piece water cooling passage has no joints to permit leakage—no water drip to contaminate welds.

◀ Diagram shows leakproof, one-piece water cooling passage in LINDE's new HELIARC HW-18 Hand Welding Torch.

**EASY, MORE ECONOMICAL MAINTENANCE**

Collets, collet bodies, cups and caps are interchangeable with those of your HW-17 Series 2 Torch. All couplings have standard IAA connections, and adaptors are included. Your production costs are lowered, too, for the new HW-18 saves time in hard-to-reach spots. Torch is designed for continuous 300-amp service, a-c or d-c.

**ARGON SHUT-OFF VALVE**

(Optional) saves time, steps and argon.

*For the best in electric welding ...look to LINDE*

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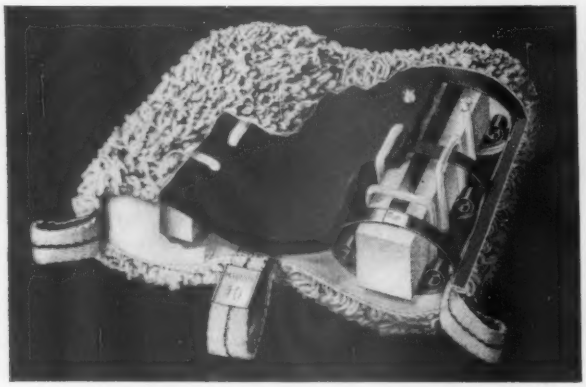
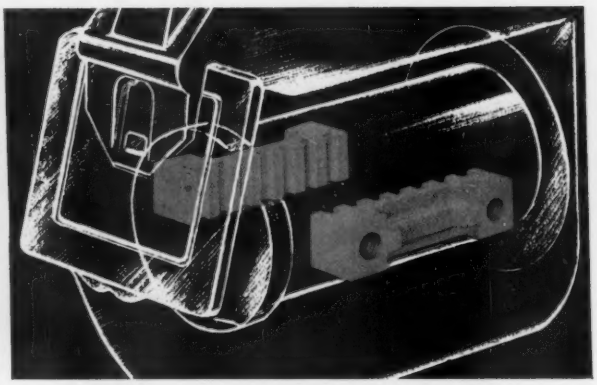
*Magnus Lubricator Pads and R-S Journal Stops give two-way protection against all major causes of road setouts due to bearings— provide the bearing performance railroads WANT, at a cost they can AFFORD TO PAY—RIGHT NOW!*





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**wick more oil, hold more oil, provide uninterrupted journal lubrication**

Use Magnus Lubricator Pads to deliver the maximum amount of oil to the journal from an abundant oil supply. There's 3-way wicking—circumferential, internal and center-feed—and each pad holds 2.5 times its own weight in oil—better than 5.9 pints for the 6"x 11" size.

Rugged one-piece twin-lobe construction assures long life. Thoroughly tested internal springs provide *maximum and constant* resilience—pads just can't lose contact with journal during their useful life. The cover is heavy pre-shrunk duck, tufted with quality cotton yarn and backed by high-capillarity felt. In all, it's a lubricator pad designed by bearing experts to give you the performance you want and need.

### MAGNUS R-S JOURNAL STOPS

**stabilize the whole bearing assembly— double bearing life, cut hot boxes 90%**

With R-S Journal Stops you keep the bearing in proper position at all times—restrict fore-and-aft movement of the axle to 3/32" in either direction. That prevents dust guard damage, lets oil seals work. You increase miles per hot box ten times, *miles per cut journal* fifteen times. You reduce wheel flange wear, cut truck maintenance costs all along the line.

Initial cost is low—only 1.25% of new car cost—and you get that back in less than 3 years. That's why R-S Journal Stops are your best bet for better bearing performance.

***For complete information on R-S Journal Stops and Magnus Lubricator Pads write to Magnus Metal Corporation, 111 Broadway, New York 6. or 80 E. Jackson Blvd., Chicago 4.***

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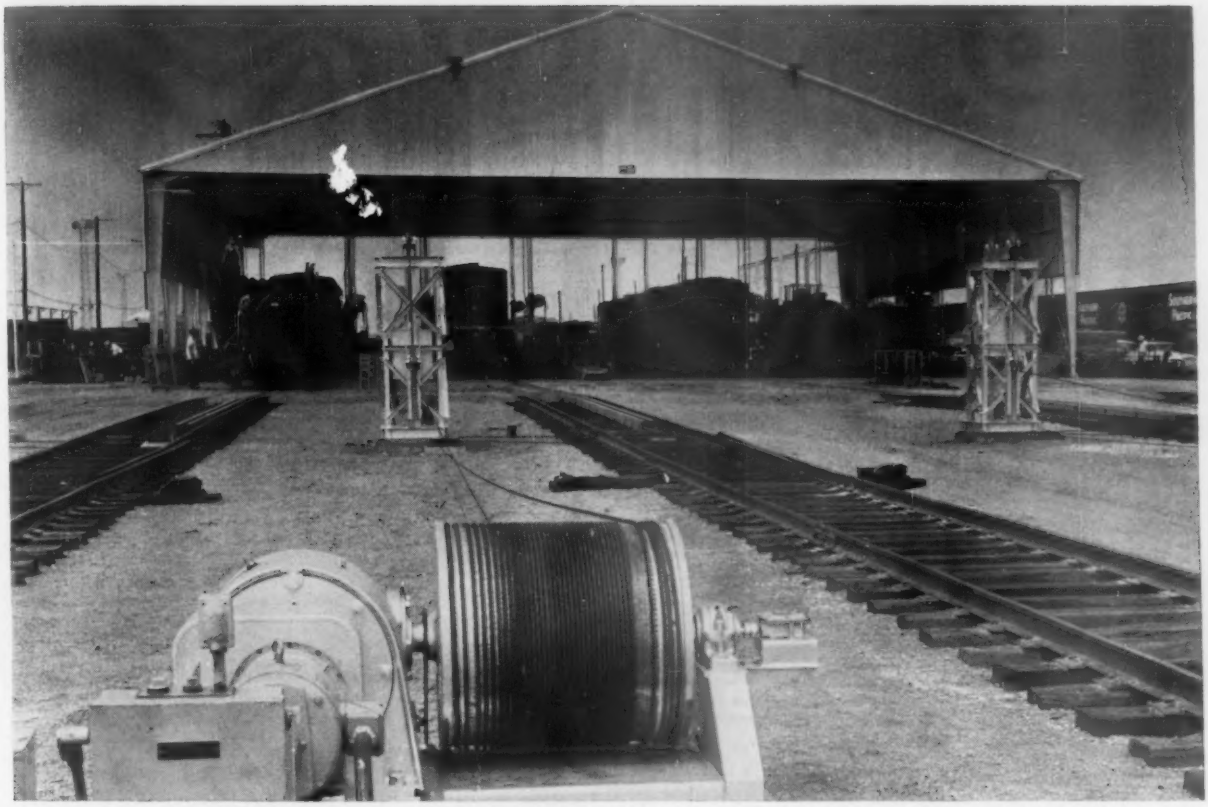


Sheltered and lighted work area, mechanical moving of cars, and high-speed jacking are features of SP one-spot installations.

# SP Adopts One-Spot Car Repairs

## *Two major yards now have production-line facilities in place of former rip tracks*

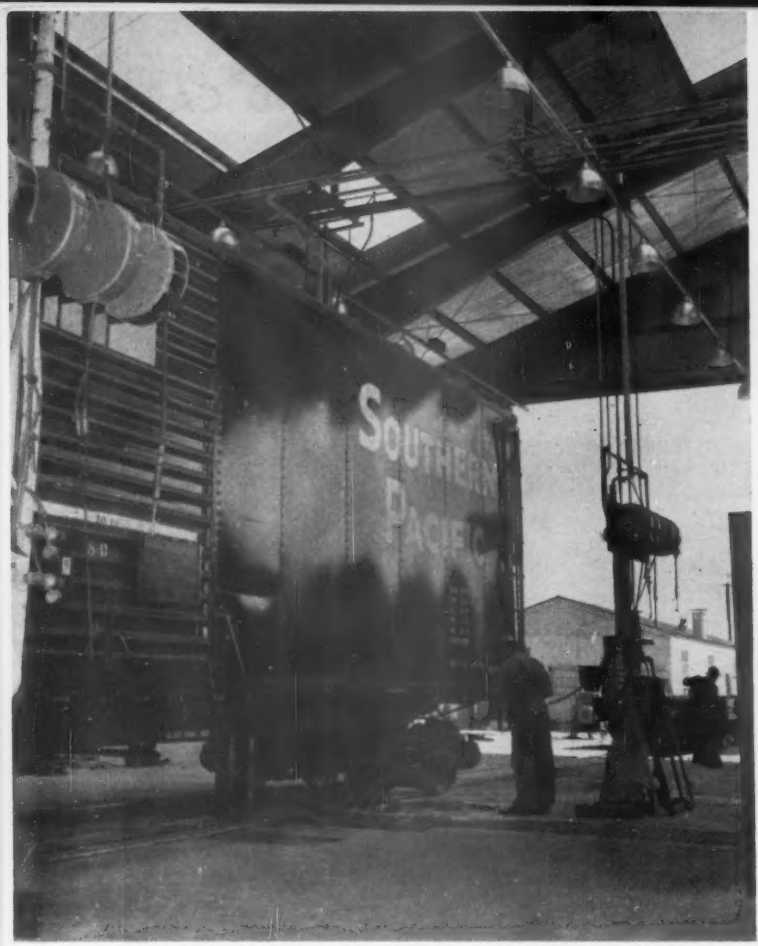
Two new one-spot car-repair facilities recently went into operation on the Southern Pacific. One is at Jennings Yard, Roseville, Cal., and the other at Englewood Yard, Houston, Tex. The one-spot car-repair system will expedite repairs to cars bad ordered in the train yards. The Jennings facility is a three-track system with inbound leads, a repair building housing the work area, and an outbound section where cars can be accumulated prior to returning them to the train yard. The Houston facility is similar, but has four repair tracks rather than three.

Construction on both facilities began in January. Roseville was completed early in June. At Englewood, the first two tracks were placed in service in mid-May and the second pair of tracks started operating at the end of May.

At both sites, original rip-track layouts were removed and the spot facilities installed on the same location. Inbound leads are each divided into two sections, the first to receive cars from the train yard and the second for accommodating cars to be progressed into the repair area without interrupting repair work. All the repairs previously handled at the original rip tracks will be made in the new facilities.

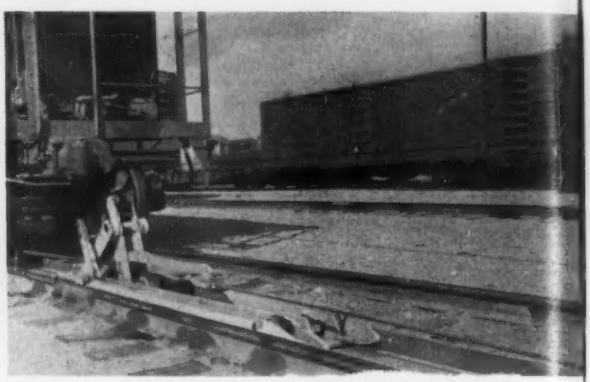
Mechanical car pullers, operated by push-button controls located in the repair area, are installed on the inbound sections. Upon completion of repairs, the cars are moved from the repair areas by the mechanical pullers to outgoing tracks before being switched back to the train yard.

All of the repair work is performed within the repair building, one car at a time on each track. The repair area is equipped with stationary hydraulic jacking equipment designed to raise one end of a car in a matter of seconds,



Material stocks, tools and hose reels are conveniently grouped around work area on each track. Skylights provide daytime illumination.

Controls for car movers and derails are located at the work site so that operator need not leave work station.



Car movers, installed between rails, are cable driven. Tensioning device for cable shows at upper right.

either from the side or center sills. With the car end supported at the side sills only, for example, work on the center plate and center still is simplified.

Car stoppers used at the jacking locations assist in properly spotting the cars. Jib cranes equipped with electric hoists are used in making truck repairs. Each track is also provided with hose reels for oxygen and acetylene, journal-box oil, air and oil for cleaning journal boxes, water, and compressed air for testing brake equipment and operating pneumatic tools.

At Jennings Yard, welding machines are installed overhead with reels for handling the welding cable. Mobile cranes handle material and assist in car repair work at both facilities.

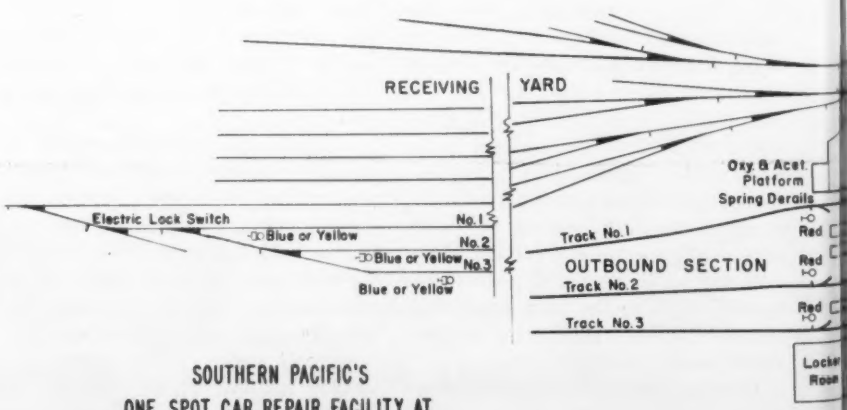
Material is strategically located within the work areas to be readily accessible to each repair track, while heavy materials, such as wheel and axle assembles and side frames, are stored adjacent to the repair building.

It is not generally necessary to segregate cars as to class and kind of repairs. However, one track at each side is equipped with car tie-down devices to assist in heavier repairs when required. Output is approximately the same as with the former rip-track method. The new facilities are designed to operate during hours of darkness as well as during the day, and operations are geared to the work load.

Billing repair-card data is voice-recorded on tape and transcribed on the AAR billing forms in the offices in lieu of preparing a written record at the car-repair site.

Every effort is made to have the repair facility as efficient as possible. Entrance switches are manually operated and electrically locked. They are controlled from the repair area by push button. Power-operated derails and the electric blue-flag system are push-button controlled. A communications system is installed between the repair area, train yard and yard tower.

The facilities were also designed to




SOUTHERN PACIFIC'S
ONE SPOT CAR REPAIR FACILITY AT
JENNINGS YARD, ROSEVILLE, CALIFORNIA

provide the best possible working conditions for employees. Sections of the repair building roof are equipped with clear plastic panels to admit natural light during daylight hours and, good lighting is provided for night operations.

### Radiant Heating

At Roseville, radiant floor heating will make the work area more comfortable during inclement weather. Toilet and lavatory facilities are installed both in the work area and in a separate locker and lunch room. A new air-conditioned office with modern lighting and heating has been built adjacent to the repair building. At Houston, clerical forces are not housed in the repair area, while supervisors' officers are nearby.

Engineering at Roseville was handled by the engineering and mechanical departments under W. M. Jackle, chief engineer, and S. M. Houston, general superintendent mechanical department, respectively. Actual construction was under the direction of Sacramento Division Engineer H. F. Dully. Car repair operations are supervised by N. G. Moore, master car repairer, and R. L. Cannon, general car foreman.

At Houston, engineering was directed by Chief Engineer L. A. Loggins and Mechanical Department Superintendent F. E. Russell. The former directed actual construction efforts. The new car repair facility is operated under the supervision of P. L. Scott, shop superintendent. Layouts and procedures are based on developments originated by the Southern Railway.

J. W. Corbett, SP vice-president—operations, in an address at last June's AAR Mechanical Division meeting, spoke of SP experience with the "spot" repair system. "Materials," he said, "are brought to the men doing the work. This is contrasted to the conventional method of sending men out with the necessary tools and repair parts to different sections of the widespread rip tracks where cars to be repaired are located.

"Repair parts and tools are conveniently located at the work stations and are available without delays or difficulties. As a result, cars are repaired in short order and are kicked out automatically to the outgoing track where they are accumulated for return to the train yard. As each car is ejected from the repair shop, another is brought in to keep the flow of work continuous.

"It gives the railroad repair function the feeling of the modern, highly efficient industrial operation that it should be," Mr. Corbett concluded. "If we can apply this same type of repair philosophy to our other maintenance practices, we will reach another plateau in the more efficient operation of the railroads."

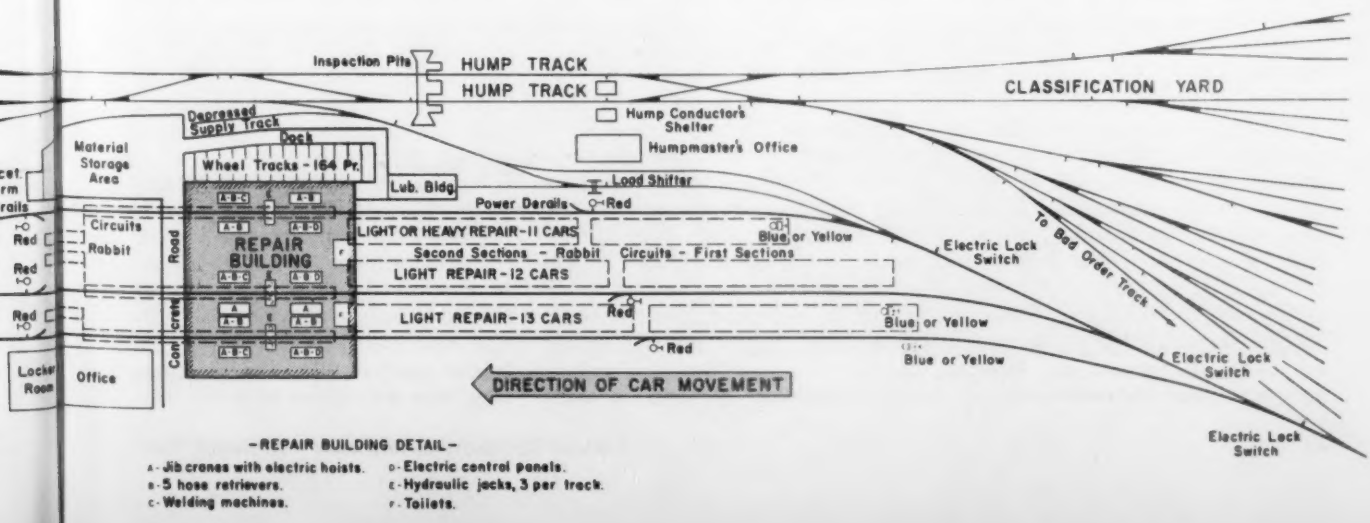
### Today's One-Spot System

The spot car repair system for running repairs and periodic attention is steadily gaining in popularity across the U.S. From the beginning, Railway Locomotives and Cars has publicized the work of different railroads in making these car repairs more efficiently. They include:

- Norfolk & Western, Bluefield, V. Wa.—Sept. 1948, p. 473.
- Central of Georgia, Columbus, Ga.—Sept. 1954, p. 54.
- Central of Georgia, Atlanta, Ga.—May 1956, p. 60.
- New York Central, Buffalo, N.Y.—Sept. 1957, p. 50.
- Southern, Birmingham, Ala. (CDOA report of Committee on Light Repair Tracks and Train Yard Operation)—Nov. 1957, p. 28.
- Central of Georgia, Macon, Ga.—Sept. 1958, p. 31.
- Pittsburgh & Lake Erie, Youngstown, Ohio — Jan. 1959, p. 13.

With each succeeding installation, techniques and equipment have been refined. Today, there are a number of manufacturers supplying equipment designed specifically for "spot" repair installations. One of these major suppliers cites the following advantages of today's "spot" system:

- Labor efficiency is increased over 100 per cent by bringing the cars and materials to the man's work site where direct supervision can be provided;
- AAR billing, calculated on basis of less efficient procedures, can be made to show a profit on repair of foreign line cars;
- Per diem can be reduced because cars can be delivered to interchange points sooner;
- Switch-engine hours can be reduced because cars need only be delivered to the work site; no longer must they be classified and spotted on repair tracks;
- Safety of workmen is assured and working conditions are improved. Manual lifting is virtually eliminated.



Lehigh Valley, after ICC hearing, was allowed to make 60 per cent passenger service cut which released several of these Alco units.

Local and branch line freights have been assignments for these LV units in past. Now they may be assigned to fast through runs.

# What Happens to Passenger Units

## *. . . When Train Service Is Reduced?*

PASSENGER DIESELS on several roads are already without regular assignments; and there is every prospect there will be more of these units jobless in the months ahead. Those same streamlined, brightly colored, high-speed, high-horsepower units that a dozen short years ago were adding new glamor to American passenger trains can be seen today handling work trains and local freights.

What went wrong? The passenger train primarily. Elimination of train services is beyond the stage where only branch line runs hauled by road switchers are affected. Roads are now eliminating and consolidating main line runs which have been handled by road passenger locomotives. What becomes of these big 2,000, 2,250 and 2,400 hp units when there are no longer passenger trains for them to haul? What can a motive power officer recommend when his management asks what to do with an idled Alco PA-3 or an Electro Motive E-8?

Railway Locomotives and Cars has surveyed those railroads which own road passenger locomotives. Ten of the 34 roads responding reported they already have surplus passenger units. Others commented on the seasonal nature of their traffic which makes some of these units surplus during certain seasons. Roads participating in Florida services and Western lines mentioned seasonal traffic.

In the most recent summary of railway motive power, the AAR reported that on July 1 there were 1,620 A units and 411 B units assigned to passenger service. A total of 184 of these units were stored serviceable, or were in or awaiting shop. Not all the locomotives reported in this summary are of the 2,000 to 2,400-hp types which present special problems.

A number of railroads have always operated some of their passenger trains with road switchers and with boiler-equipped freight units. As these trains disappear, their locomotives can be assigned directly to freight service, leaving road passenger diesels handling the surviving passenger trains.

This is the case with the Southern which reported that the "upper half" of its passenger locomotive fleet "consists of F type General Motors freight locomotives used in passenger service. These will be placed in freight service . . . which leaves no problem at all." Similarly, the Santa Fe reported "as the majority of our passenger locomotives are of the EMD F-7 type, we have not been faced with any large excess of passenger locomotives, with the exception of a few extra Alco cab units which we are utilizing in extra freight service in our more level territories whenever a freight power shortage exists."

The problems involved in using high-powered, six-axled, four-motored passenger units in freight service include:

- High horsepower rating per driving axle;
- Sacrifice of adhesive weight because of the two idler axles;
- Continuous rating at speeds higher than practicable for freight service;
- Impossibility of re-gearing to drop continuous speed into range of many road freight units;
- Absence of automatic backward transition on some units.

In an interview on high-horsepower locomotives, N. C. Dezendorf, vice president and general manager of the Electro-Motive Division, recently said: "The high-speed passenger locomotives gradually got up to 600 hp per driving axle, where we now have 2,400 hp on four driving axles—that is 600 hp per axle. Now that makes a very slippery freight locomotive. It is only good for speed. You can put 3,000 hp on a four-axle locomotive if you want, but you won't be able to use it in heavy freight service."

The designs of trucks used under road passenger locomotives make it impossible to install motors on the center idling axles. New trucks would be a possibility. The three-motored Flexicoil truck used with EMD SD-type road switchers has an H-type bolster which would raise the passenger unit carbody 6 to 8 in. This

would necessitate the lowering of couplers and other components—major structural jobs.

To put the continuous rating into the range where passenger units could be utilized effectively in freight service without new trucks and additional motors is difficult. Here the EMD units present special problems. While 40-in. driving wheels have been standard on Alco, Baldwin, and Fairbanks-Morse passenger locomotives, all Electro-Motive E-type units have 36-in. wheels. This limits the size of driving gear which can be applied.

The standard gear range for EMD passenger locomotives has been from 52:25 with 117 mph maximum speed and 39 mph continuous through 55:22 and 56:21 to 57:20 with an 85 mph maximum speed and 27 mph continuous. Electro-Motive does have a 58:19 ratio, but even this produces a locomotive with a continuous speed far higher than that of a conventional 62:15 freight unit with which the passenger locomotive might have to be operated. EMD does have available a backward transition for use with these locomotives.

The standard gear ratios can produce a continuous speed of down to 16 mph on one of the Alco 2,250 or 2,400 hp units. This entire situation was summarized by the answer of one railroad to our survey: "Truck modifications would be required in high-horsepower units to attain optimum tractive effort characteristics for freight service."

When roads were asked about future assignments for displaced passenger units, most indicated that units could be assigned to high-speed, low-tonnage freight trains. In the case of relatively level roads like the Atlantic Coast Line, Florida East Coast, and Richmond, Fredericksburg & Potomac, these units can be operated in multiple with road freight and road-switcher units without reducing the tonnage ratings of the freight locomotives. J. W. Hawthorne of the ACL stated that their passenger units "constitute additional horsepower in a multiple unit locomotive for handling heavier high-speed trains."

Variations in continuous and maximum speeds complicate the multiple operation of freight and passenger units on grades. However, S. M. Houston of the Southern Pacific, stated that, with gear ratio change, passenger diesels will be considered equivalent to freight locomotives.

Thirteen roads indicated they will assign passenger units to freight service in their original condition. Four others said it would be done only if gear ratios are altered. Seven lines indicated that their road passenger power will not be used for handling freight trains. These seven are all lines with heavy grades.

With the recent interest in the 2,400-hp road switchers, we asked if the 2,400-hp road passenger unit might be any more attractive as a freight locomotive today than was formerly the case. Seventeen roads reported these locomotives were no more attractive, four said they might be, and one commented that they could be useful "horsepower-wise only."

When asked if they would consider having passenger units rebuilt by manufacturers for other service, seven lines responded that they would not. Two indicated that rebuilding was of some interest. However, one of these said that only the engines and motors would be utilized in rebuilding older switching locomotives. Nine reported that the subject has been studied, and four others said they would not consider it now. One SMP reported that the subject has been considered, "but cost is prohibitive and horsepower is not sufficient to warrant the expense."

Fourteen lines said they were not considering retirement of passenger locomotives displaced from passenger service, while six indicated that this might well be the best solution. Five indicated that the physical condition of the unit and its age would determine its disposition.

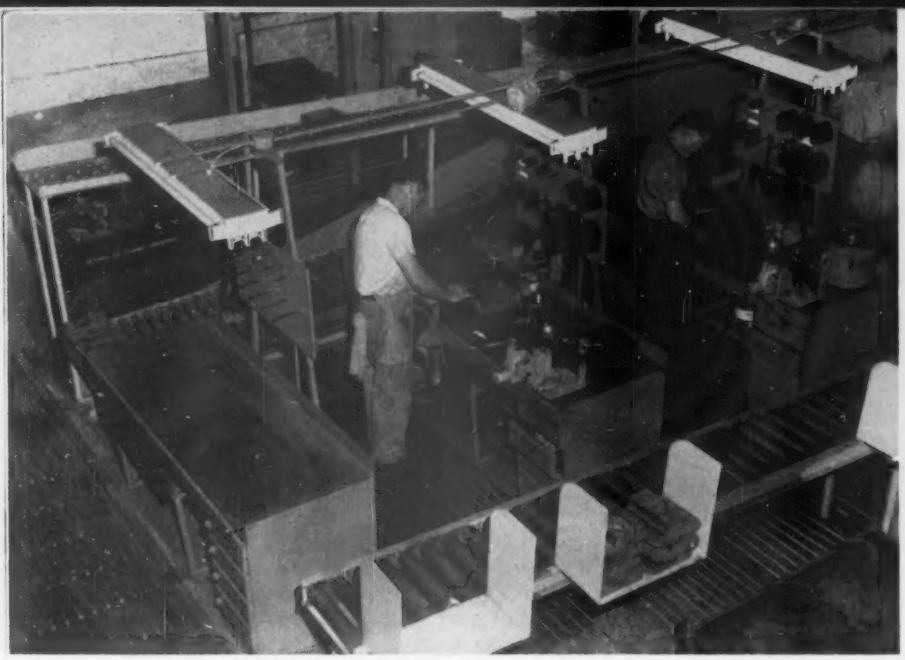
Builders stated that rebuilding would be the expensive procedure which several roads indicated they had found it to be. Neither Electro-Motive nor Alco could report a generalized solution for the problem. Each indicated that individual operating conditions and economics would, of necessity, dictate individual solutions.

As Alco put it, "It is desirable to utilize the passenger motive power to the best interests of *individual* railroads. There is no easy solution to the problem.

"The simple changing of gear ratios on Alco passenger locomotives—obviously an inexpensive conversion—would produce a compromise mechanical design and would affect the overall operating efficiency of the unit. With necessarily high depreciation rates, together with poor utilization and higher operating costs, such a surface conversion would jeopardize sound investment practices. More thorough conversions, with higher expenditures, can produce a balanced design that would satisfy all considerations.

"The conversion problem cannot be boiled down to one or two possibilities. The problems of the individual railroads must be met separately, with every likelihood that solutions will be different from one road to the next."

Maine railroads—Bangor & Aroostook and Maine Central—have asked to end all passenger service. One of BAR's two E units has been surplus for some time except during bad weather (left). Maine Central has seven E's (right) which may soon have no passenger runs to haul.



Assembly benches are fluorescent lighted and have gasket boards fully stocked. Parts are removed from conveyor at rear, assembled into complete valves, and placed on conveyor in foreground to be moved to the test racks on special plywood carriers.

Disassembly involves removal of shipping cover, and placing small parts in wire basket for immersion in cleaning tank with stripped body.

# SAL Streamlines AB Brake Overhaul

## *Production line composed of series of specialized operations makes greater output possible*

Emergency portion test racks (right) and service portion racks (left) are located on both sides of conveyor on which tested valves are moved to site where shipping covers are applied.

FOR ALMOST TWO YEARS the Seaboard has been operating an air-brake shop which was designed to clean all the AB freight-car brake portions for the entire railroad. Actually, it represents an expansion and modernization of an existing brake shop at the SAL West Jacksonville, Fla., shops.

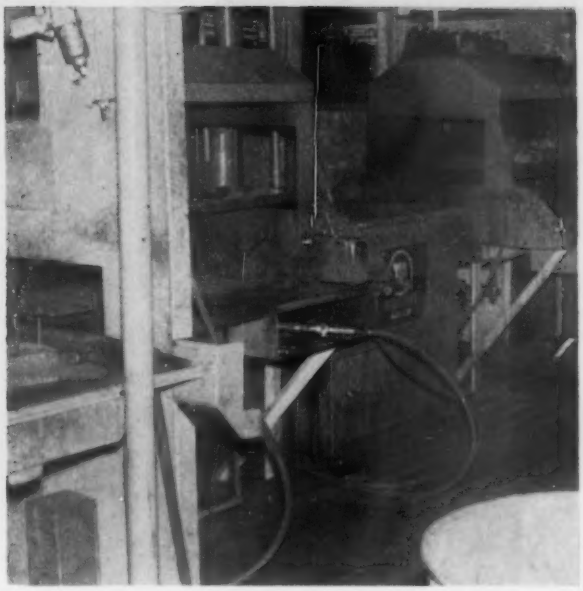
Equipment, benches and conveyors are designed to service up to 1,000 car sets per month. In a typical recent month, approximately 600 sets were cleaned, tested and repaired. The shop is composed of two sections, each of which has approximately the same arrangement of benches and conveyors. Emergency portions are serviced in the one section and service portions in the other.

Prior to rearrangement of this West Jacksonville shop, it had been servicing about 160 car sets monthly. These came from the freight-car shop and from the local car repair track. It was strictly a conventional benchwork system.

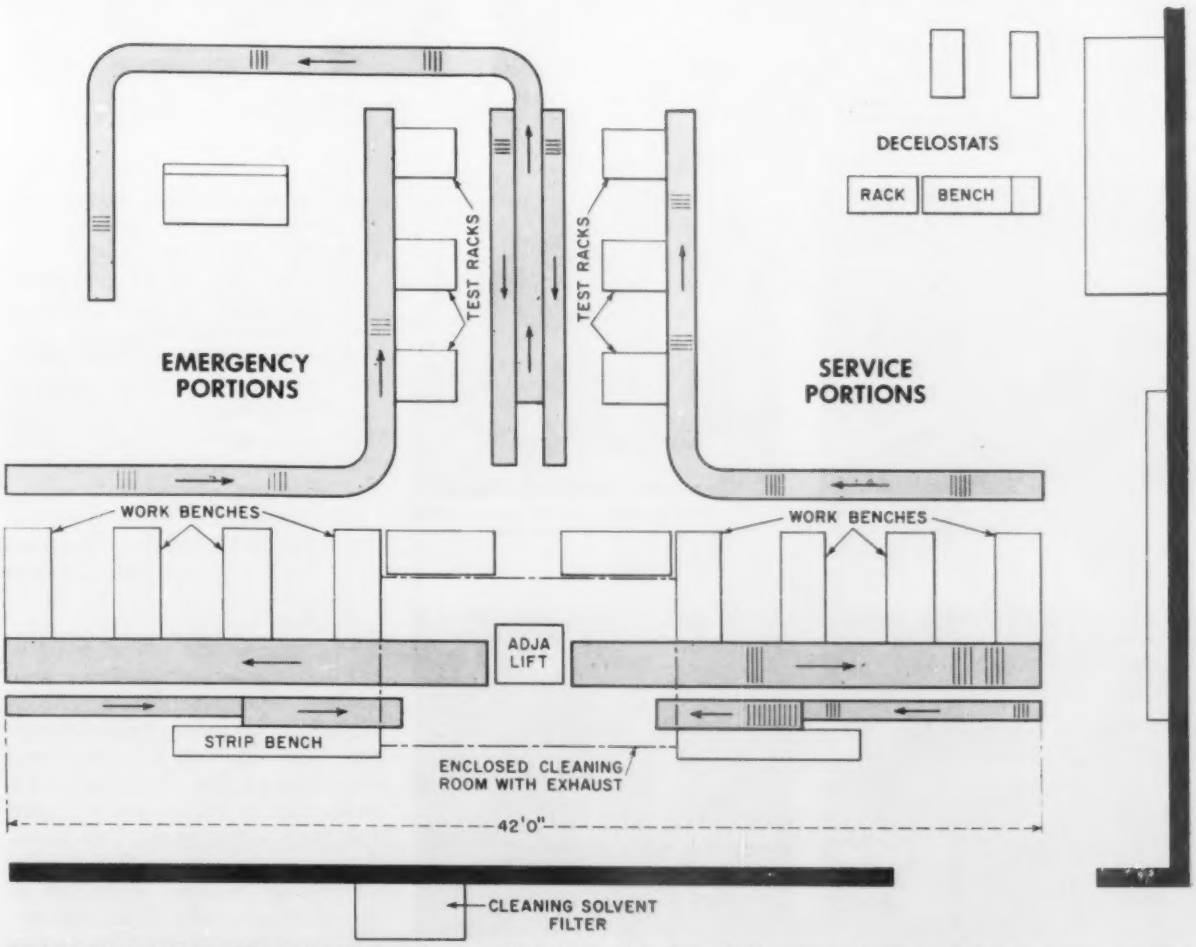
In 1956 the decision was made to

(*Continued on page 48*)

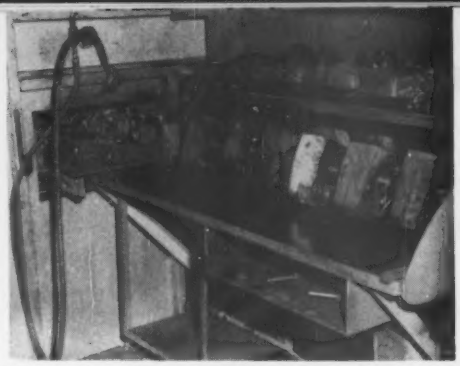
Shipping containers, placed on lower conveyor, move to end of line for application to overhauled valves. Empty parts baskets and the pallets which carry bodies are placed on upper conveyor by bench men.



Cleaning area is centered around Magnus Aja-Lift machine. Benches at each side provide space for parts to drain and to be blown dry. Parts are then placed on conveyors to be moved to benches.



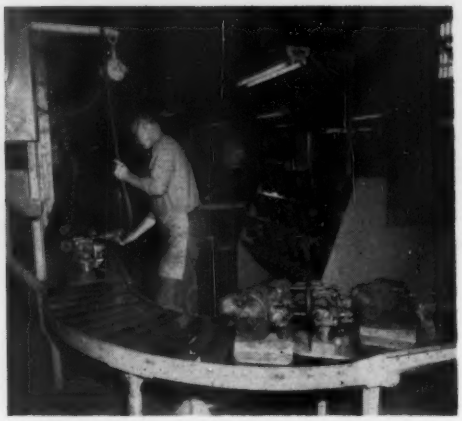

Concentrated cleaning, assembly and testing operations for AB brake have made it possible for Seaboard to perform all work at West Jacksonville shop. Benches above cleaning room are devoted to reworking valves returned from test racks.



Brake parts are blown dry before being moved to work benches for assembly with new gaskets and seals.

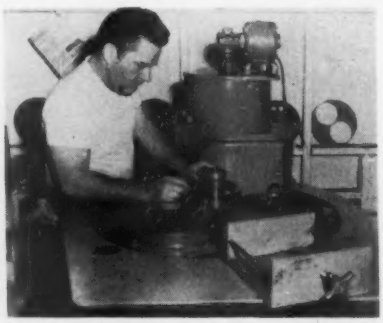
Man at bench takes all parts for one emergency portion and assembles it. Conveyor is storage for cleaned parts awaiting assembly.

Assembled valve is placed on plywood carrier for movement through remainder of process. Bench at left foreground is for reworking rejects from test racks.

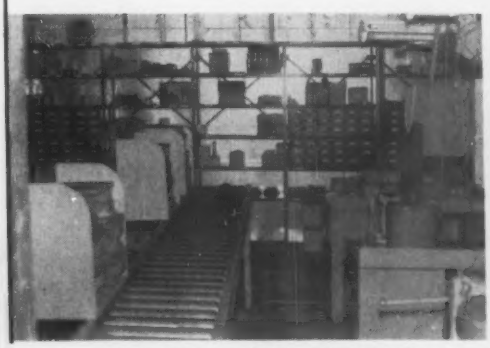


Shipping covers are applied by air-operated wrench over conveyor line. SAL does not paint portions.

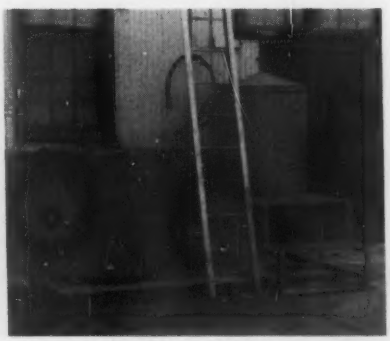
Portions are loaded into tote boxes for line points or for car shop at West Jacksonville.



Lapping of brake parts is done on this Crane Lapmaster. Another area does diesel valves.



Stock of parts, maintained in brake shop, saves trips to the main shop storeroom.



Cleaning solution is reclaimed by passing it through calcined Fullers earth.

centralize AB servicing at Jacksonville. In January 1958 the installation was completed. The shop now has a series of specialized operators connected by conveyors which eliminate handling and serve as storage areas.

The output of 600 car sets monthly was turned out by a force of men, assigned as follows:

2—Disassembly
2—Cleaning
4—Benches
2—Test racks
1—Test racks and shipping covers
1—Decelostats and miscellaneous parts
1—Apprentice

Operation at the design figure of 1,000 sets monthly has never been possible, because there has never been the demand for production at this high rate. Soon after the new shop went into operation, the mandatory AAR brake-cleaning period was extended from three to four years. This immediately reduced the need for overhauled brake portions. Even with all this work concentrated at Jacksonville, there have been no production problems.

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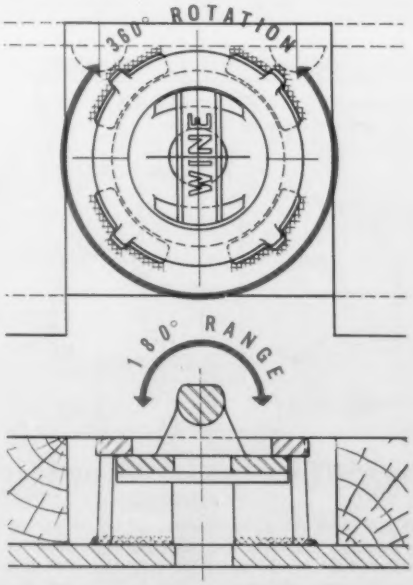
Electric cast steel with an unlimited range of adjustment in two planes, the universal type anchor is best suited for flat car floors and drops flush when not in use. Multiple application of the universal type affords anchorage from any angle.




THE WINE RAILWAY APPLIANCE COMPANY

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DIVISION OF UNITCAST CORPORATION

TOLEDO 9, OHIO

# Radioactivity Checks Oil Consumption

RADIOACTIVE RING TESTS have been used by a number of railroads to determine factors important in producing excessive diesel engine wear and consequent high maintenance costs. In these tests, the amount of metal worn from irradiated rings is determined by passing the lubricating oil through a counting well where a Geiger counter indicates the intensity of radiation (RL&C, March 1959, p 15).

Recently, Cooper Bessemer, builder of engines for General Electric road locomotives, revealed how it has been using radioactive tests to determine the quantity of lubricating oil used by a diesel. Just as radioactive ring tests make possible the determination of engine wear in a short time, the Cooper-Bessemer technique cuts the time necessary to determine how various engine conditions affect lubricating oil consumption.

The lubricating oil used was Sinclair Super Tenol SAE 40 which normally contains a zinc additive. Oil for these tests was prepared by synthesizing this additive, incorporating radioactive zinc-65 as a tracer. As the lube oil is burned in the engine cylinder, the radioactive tracer is carried into the exhaust stream. By constant sampling of this exhaust, it is possible to determine what is happening in the engine and when it happens.

In the standard Cooper-Bessemer 100-hr oil consumption and ring wear test for new diesel engines, using previous methods, oil consumption normally could be determined only by measuring the amount of lubricant added to bring a crankcase level to its initial height. Since oil consumption in any one short period could not be detected, it was difficult in the past to determine during a 100-hr run if excessive oil consumption was occurring at any one particular period. The same held true for piston-ring wear or other wear variables occurring during some part of the test run period.

To find answers that would effectively help evaluate engine wear and oil consumption, particularly during the break-in period, Cooper-Bessemer research engineers, in conjunction with Battelle Memorial Institute, have developed this radioactive tracer method of engine research. The method has proved to provide the necessary sensitivity by successfully measuring the rate of oil consumption as a function of time and engine operating conditions.

Briefly, the results of the initial tests show that:

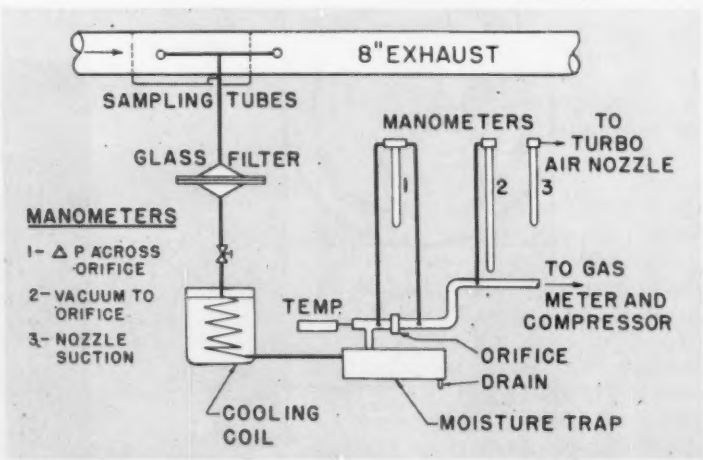
- The rate of lube-oil consumption does not change during the first 100-hr run-in period;
- If there is early high piston ring wear, it has no apparent relation to oil consumption;
- As engine speed and load increase, oil consumption increases;
- Increasing of oil temperature and water-jacket temperature decreases oil consumption;
- The existence of the top oil ring on a piston has a marked effect on maintaining low lube oil consumption.

One hundred millicuries of zinc-65, an isotope with half life of 245 days, was procured from the Oak Ridge National Laboratory in the form of zinc chloride solution. It was changed to zinc hydroxide and then to zinc oxide. Thiophosphoric acid ester, a component of the additive, furnished by the Sinclair Research Laboratories, was neutralized with the zinc oxide. A small quantity of neutral diluent, also furnished by Sinclair, was added to the zinc oxide-acid ester mixture, and the entire mass was filtered to remove any unreacted material.

An equal amount of the filtrate was added to each of five 55-gal drums containing 40 gal of oil. Sufficient quantity of non-radio-active zinc additive was added to give a finished product which met Sinclair specifications. The additive and oil were mixed by rocking the drums. Samples were taken periodically during the mixing process until it was shown by a constant specific radioactivity level that the mixture was homogenous.

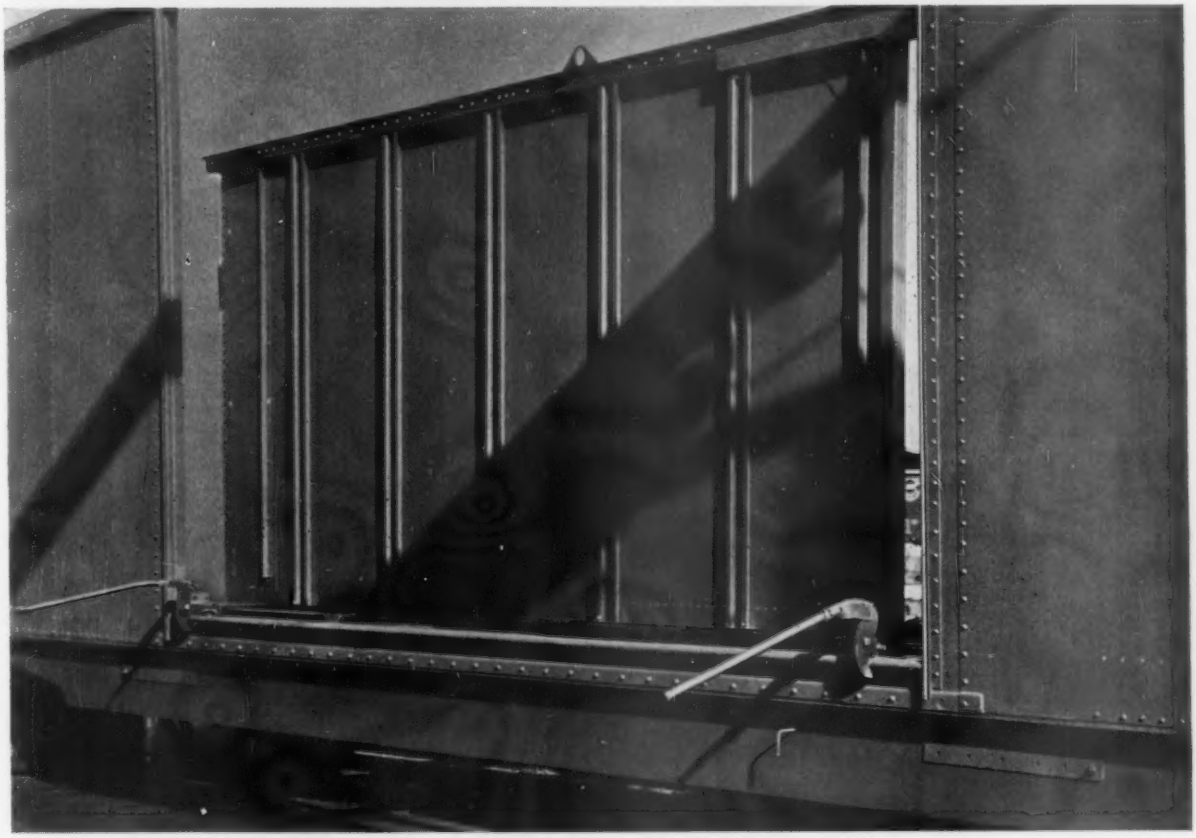
Approximately 51 millicuries of the original 100 millicuries of zinc-65 had been incorporated in the radioactive-labeled additive. The oil then was tested in the engine. Its gamma ray emmission was used to determine the oil consumption.

Lubricating oil consumption during first 100 hr can be measured readily with radioactive technique recently developed. Other engine conditions can also be investigated with lube oil carrying isotopes.




Testing system samples exhaust which carries radioactive residue of burned lubricating oil. This arrangement was used in the Cooper Bessemer test department for the initial work. Oil consumption was found to increase from 0.01 gph at no load up to 0.09 gph at 200 bmep. With no top oil rings, consumption went to 0.14 gph at 200 bmep.

# *the New Wider Doors Need the Extra Strength of M·F Threshold Plates Now More Than Ever Before!*



M·F Threshold Plates have been standard specifications for well-built freight cars for many years.

And because today's wider openings make a weak spot weaker, M·F Threshold Plates are more strategic than ever in freight car design – as integrated structural members of the car.

Another advantage of M·F Threshold Plates is that uniform length floor boards or steel flooring may be used throughout the car.

Floor boards do *not* pass under M·F Threshold Plates so replacement of worn or broken flooring is easier and faster.

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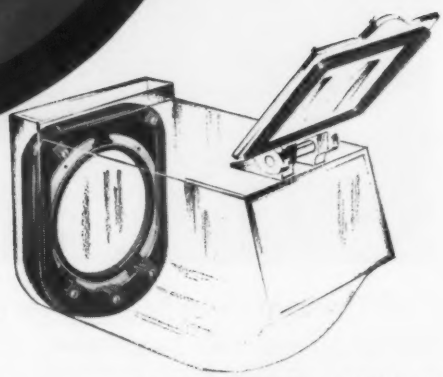
a gasket with "give"



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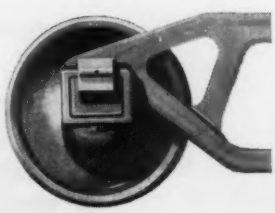

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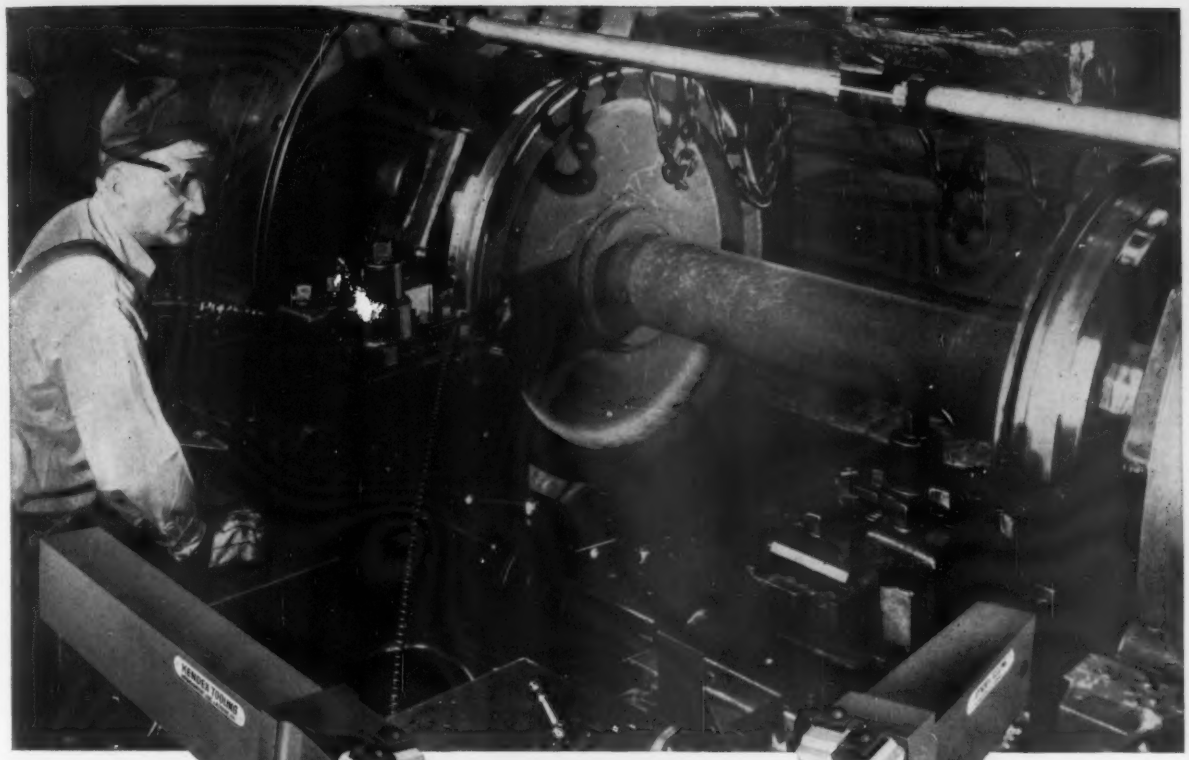


Tread and flange profiling tool for Niles Lathe

**Designed for Niles and Sellers lathes . . .**

Tread and flange profiling tool for Sellers Lathe

# THESE NEW KENDEX* TOOLS OFFER COST-CUTTING ADVANTAGES

More than two years of development and testing in shops of several railroads have *proved* the merit of these new Kendex tools designed specifically for wheel turning.

Using clamped, turnover-type inserts with multiple cutting edges, these tools eliminate all regrinding. When one cutting edge becomes dull, the insert is merely given a quarter-turn to a new edge, until all edges of each side have been used. Insert replacement is then a simple operation controlled by one screw in the clamp.

A solid Kennametal* shim provides a solid seat for the insert and permits harder, more wear-resistant grades of Kennametal to be used. Chipbreakers of Kennametal provide better chip control and eliminate much grinding expense.

In shops where these new tools were tested, results in the form of reduced tool change time, improved finish and reduced tool costs were so outstanding that Kendex tooling was quickly adopted as standard. Now, after months of actual production service, the advantages of the Kendex design have been thoroughly proved. If you will check the typical performance report at the right, we think you will want to try these new Kendex tools, too. If so, just call your Kennametal Representative or write KENNAMETAL INC., Latrobe, Pa.

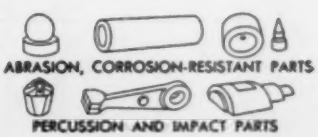
*Trademark

TYPICAL CASE HISTORY
Kendex vs. Conventional Tools

Operation: Profiling tread and flange 40" diesel wheels on Niles Wheel Lathe

| | Conventional Tooling | Kendex Tooling |
|---|---|---|
| Number of wheels (basis of comparison) | 2710 | 1973 |
| Wheels per edge | 6 | 8 |
| Time required to change tool | 15 min. | 5 min. |
| Cost of carbide only per set of wheels | $.818 | $.312 |
| Regrinding cost per set | $.33 | Not required |
| Carbide plus grinding per set | $1.15 | $.312 |

INDUSTRY AND KENNAMETAL ...Partners in Progress



**Need for handling 40-ft trailers, as well as 35-ft model shown here, required that underframe be lengthened 6 ft. NKP uses Brandon tie-downs.**

# NKP Produces Low-Cost Piggyback Cars

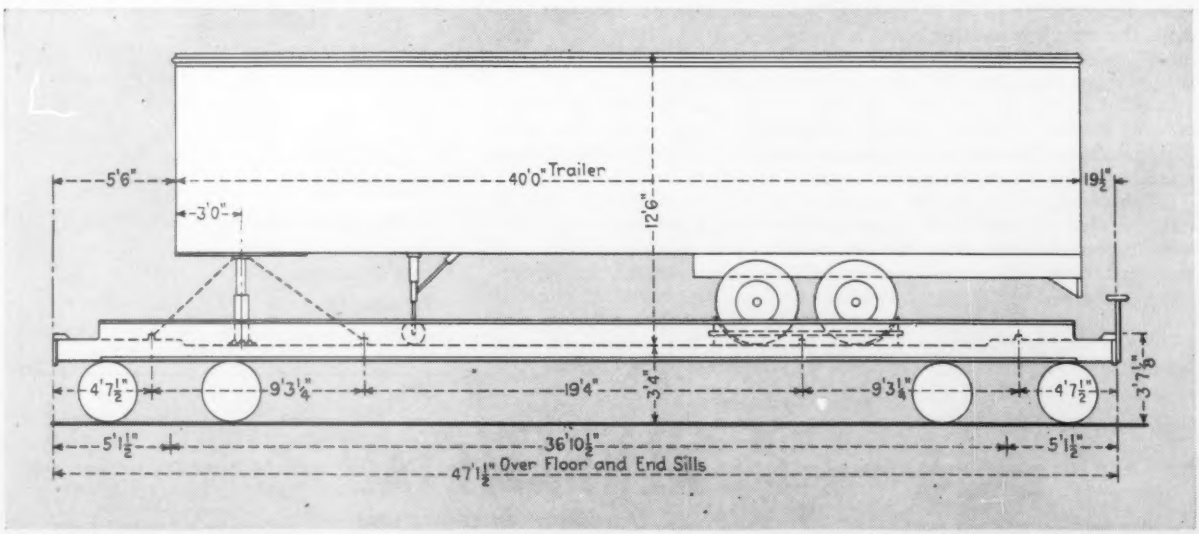
THE 125-CAR PIGGYBACK FLEET owned by the Nickel Plate on February 1, 1959, has been increased by 65 cars and will be further increased as the demands for service require. The Conneaut, Ohio, shop of the NKP turned out three new piggyback cars every two working days during the program recently completed. More cars are now being converted.

By using the center sills, bolsters, and trucks of a series of lightweight box cars acquired in 1940 and by designing the remainder of the new car structure for easy fabrication and assembly, total expenditure has been kept low. At the same time, the new cars weigh some 6 tons less than the converted standard 50-ft flat cars which have been hauling the NKP trailer traffic.

The increasing use of the 40-ft highway trailer made it necessary to produce a piggyback car with a total length of 47 ft 1½ in. over end sills. The center sill of the 40-ft box car around which the new car is built has to be extended by adding a 6-ft length of sill made of two 36.2-lb AAR Z-sections inboard of the A end bolster. This extension is welded in place, using standard AAR center-sill splices. The original crossbearers and crossties were adapted for the new car design. All cars have new 12-in. channel-type end sills. Original bolsters are used with only minor alterations.

Side sills are 20-in. I-beams weigh-

(*Continued on page 57*)



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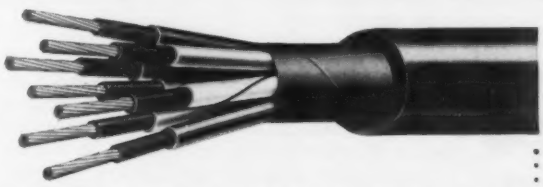
**SI-58215:** Extra-flexible rope stranded, coated-copper conductor. Also available in smaller sizes for control and auxiliary circuits. Meets AAR Specification 581.1.

**SI-58217:** Same as SI-58215 except aluminum conductor.

**For 3000-volt d-c motor leads,** as a high-voltage lead-in cable, or for any application requiring single-conductor non-shielded portable cable for locomotives and cars, use SI-58260.

**For insulation with resistance to high heat**—in dry locations, exposed, or in conduit, such as in accelerating power leads or resistor leads, use SI-57049 (rated 600 volts, 110 C conductor temperature); SI-57051 (rated 5000 volts, 100 C conductor temperature).

## FOR CONTROL CIRCUITS



For control wiring in diesel-electric and electric locomotives and multiple car units, use SI-58135. Rated 600 volts, 75 C conductor temperature.

For low-voltage control wiring in diesel-electric and electric locomotives, use SI-58218. Rated 300 volts, 75 C conductor temperature.

For control panel wiring where extremely high temperatures are encountered use SI-57334. Rated 300 volts, 125 C conductor temperature.

General Electric offers you a complete line of locomotive cables built to meet the requirements of new or maintenance wiring in power and control circuits. For further information write to Section W-231-947, Wire and Cable Department, General Electric Company, Bridgeport 2, Conn.

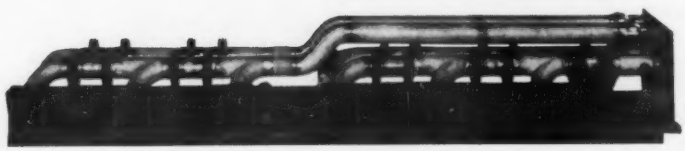
*Progress Is Our Most Important Product*

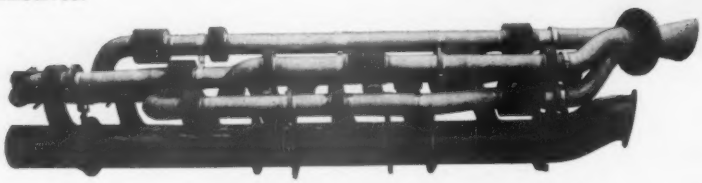
GENERAL ELECTRIC

# NEW! DIESEL MANIFOLD DESIGNED TO OUTLAST MAJOR ENGINE OVERHAULS

HANLON & WILSON MODEL 400—This manifold was designed for use on the Alco 244 engine. It is now standard equipment on many of the nation's railroads. The original production models were installed early in 1955, and they are currently in operation. On our most recent inspections, no wear or deterioration of metal is apparent.

HANLON & WILSON MODEL 569—This manifold was designed and built for the General Electric Company locomotives currently being delivered to South Africa. These units are powered by Cooper-Bessemer 12 cylinder engines, using a single turbocharger. This is a representative example of the manifolds Hanlon & Wilson design and produce for General Electric's fine family of locomotives.





HANLON & WILSON MODEL 601—This unit was designed to replace the original unit on the Baldwin 1600 series 8 cylinder engine. Hanlon & Wilson reversed original installation locations of the exhaust and intake manifolds, to reduce the accumulation of raw fuel in the manifold and to provide minimum strain and vibration. The sections are joined into one continuous unit by Hanlon & Wilson special slip joints and bellows. This insures a gas tight manifold. The unit shown is designed to fit a De Laval turbocharger. Other models are built to conform to the Elliott turbocharger.

## HANLON & WILSON COMPANY

321 PENNWOOD AVENUE, PITTSBURGH 21, PA.
ENGINEERS • DESIGNERS • FABRICATORS

SERVING THE RAILROAD INDUSTRY SINCE 1906

*(Continued from page 54)*

ing 65.4 lb. per ft. The tops of these beams are 12½ in. above the top of the center sill and the inside top flanges form the tire rub rails which are 9 ft 3⅝ in. apart. These side sills are welded to the bolsters, cross-bearers and crossties.

The wood decking between bolsters is supported on longitudinal floor stringers and angles welded to the center and side sills. The 2¾-in. oak planks are spaced ½ in. apart and are supported so their tops are 1-3/16 in. below the top of the center sill and 3 ft 4 in. above the rail. Each plank is secured to the side and center-sill support angles with MacLean Fogg floor clips and watertight bolts. Two angles welded on the sides of the cross-members form a driving surface flush with the wood deck.

Multi-grip steel plates form the floor from just inboard of the bolsters to the end sills. The top of this floor is 1¾ in. above the top of the wood floor and 3 ft 5¾ in. above the rail. It is arranged to accommodate roll-out type trailer bridges applied to diagonal corners of the car.

**Rubber Draft Gears**

The cars are equipped with National Malleable MF-400 rubber draft gears. The NKP uses Brandon jacks and holddown chains and finds this arrangement attractive because trailers can be loaded in either direction on the car.

A seven-station production line was set up to turn out piggyback cars at Conneaut shop. Initially, the box car body, including side and end sills, was cut off. Original floor stringers and similar components were removed and bolsters and cross-members straightened and altered. Next, the center sill was cut, extended, and the extra crosstie applied. Simultaneously, the trucks were overhauled. The side sills, support angles, and stringers are then applied to the underframe. Finally, the wood and steel flooring, brake equipment, and trailer tie-downs were installed.

The completed car has a light weight of 40,100 lb and a load limit of 75,000 lb. Conversion was done with under 300 man-hours. Box cars from which these piggyback cars were built had been bad-ordered for heavy repairs. They could be used because the underframes were found to be in excellent condition. END

# Does Standard Rigging Give Unbalanced Braking?

## *Wilson Car Lines study shows this might well be the case.*

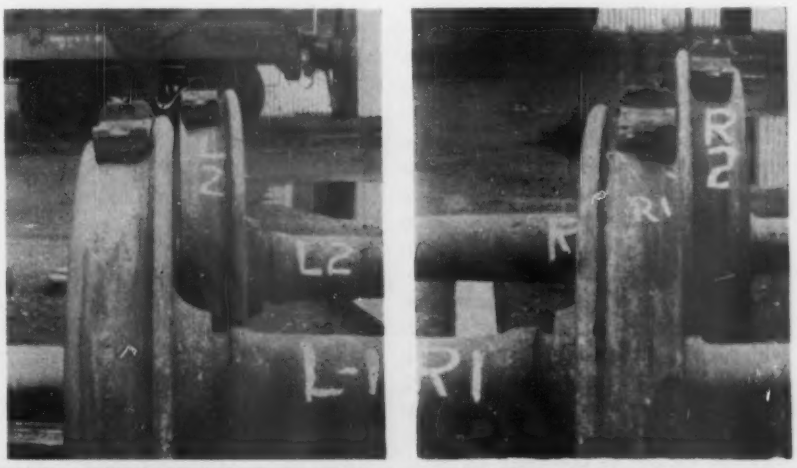
A STUDY OF brake-shoe replacements over the past 23 months points to unequal or unbalanced braking forces with present brake rigging. The data supporting this theory was obtained from four hundred 40-ft, 40-ton refrigerator cars placed in service by Wilson & Co. in mid 1957.

Initially the aim was to determine the serviceability of standard AAR cast-iron brake shoes on these heavier cars. Two hundred of the WCLX cars, series 2000-2199, are equipped with cast-steel wheels, and two hundred, series 2200-2399, with one-wear wrought-steel wheels. The ratio of car-miles operated to brake-shoe replacements was obtained by compiling the number of shoe replacements made by handling roads and Wilson maintenance forces against the number of car-miles operated.

The information developed appears significant because the brake arrangement on these WCLX cars (AB brake, spring-plankless trucks, No. 18 unit brake beams, and AAR 1½-in. cast-iron shoes) is typical of standard equipment on most cars in freight service.

Lateral component forces tend to "rotate" the brake beams in a counter clockwise direction, the Wilson study showed. This rotation tends to move one brake shoe toward the flange portion of the wheel, and the mate shoe, (on the same brake beam) away from the flange and toward the edge of the tread. Graphs of cumulative brake-shoe replacements show quite a similarity between the L-1, R-2, L-3 and R-4 positions. Some evidence also indicates that the contours which wheels assume after extended service may be related in part to the brake-shoe replacement pattern.

The brake shoe life study had been in effect for several months when data sheets on individual cars showed shoes at certain positions were being replaced more frequently that at others at mate locations. This replacement trend did not agree with established ideas of brake-shoe wear and led to a more comprehensive study than initially planned. Average life of the




**Relative positions of brake shoes on wheels from one truck of Wilson Car Line reefer shows condition which may result from unbalanced braking and does yield uneven shoe wear. Condition is also demonstrated by flange and tread contours which WCL is recording.**

shoe became secondary to a more important objective of determining the rate of replacement at each wheel location.

Shoe replacements were first summarized by units of 100 cars to show the number of replacements made each month by Wilson forces or handling railroads. Locations were also summarized. Use of 100-car units would establish the uniformity in the number of replacements to similarly sized groups of cars. Because the groups operate under identical conditions, a comparable number of shoe replacements might be expected for similar service periods. Monthly replacements for each group of cars occurred in an unpredictable manner during the first 10 months of service. After the tenth month, replacement rate at certain locations increased appreciably over the rate prevalent for the mate location (L-1 exceeded R-1, etc). Precise conclusions on shoe requirements at each location could not be made because there were some replacements at unidentified locations. When total monthly replacements and cumulative totals were charted, the varying rates of replacement at different locations showed clearly.

### Average Shoe Life

Average shoe life after 28,214,282 car-miles was found to be 8,539 car-miles per replacement. Assuming total identified replacements represent the actual rate at each location, 23 months of operation have given an average of 55.9 per cent of the shoe replacements at the L-1, R-2, L-3 and R-4 locations and 44.1 per cent at the "low" positions. While this may indicate the final replacement pattern, the ratios have varied from month to month. Until they level off, complete appraisal cannot be made.

The evidence seems to indicate unequal or unbalanced braking forces with the present brake rigging. No reasonable explanation has yet been developed. Single shoe replacements are more numerous than multiple replacements. Replacements one at a time may not be entirely compatible with today's economic and operational standards. The advantages of a wear pattern sufficiently uniform to permit replacement of several shoes at one time, or ideally by complete sar sets, seems worthy of serious exploration, according to Wilson officers.

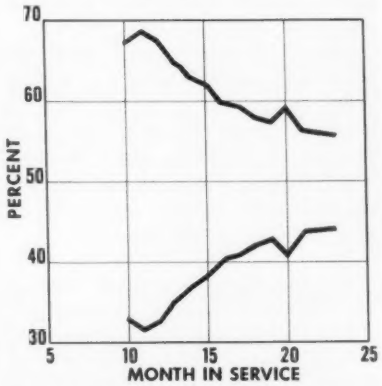
Wheel contours after extended service seem to be related to the shoe replacement pattern. Perhaps brake-shoe wear may be added to the typical wheel replacement explanations which include tight side bearings, dry center plates, operation on curves, and tight or misaligned trucks.

### Wheel Contours

Where two wheels are mismated by a few tape sizes on the same axle, an accelerated flange wear is induced on the smaller wheel. New one-wear wheels with a ten-tape differential on the same axle have been known to wear the flange of the smaller wheel to the condemning limit within 25,000 miles. A "normal" operation of 250,000 to 300,000 miles could be anticipated. If no appreciable differences in tape sizes occur, other causes should be examined.

Lateral forces tending to rotate brake beams counter clockwise may be evidenced in the "seating" of the brake shoe on the wheel after a few thousand miles. The positions brake shoes take in a braking application and wheel wear in the flange area could normally be expected to be influenced by location assumed by the shoe. Wheel contours obtained on car sets of wheels in continuous service on the same car indicate a relationship between brake-shoe wear and wheel wear. Cars 9592-9596 were equipped with journal stops. Other cars had the standard journal-box arrangement. Indications are that accelerated wheel wear may reasonably be expected in the L-1, R-2 and L-3, R-4 locations.

The effects of braking forces on "slid-flat" and "built-up" tread conditions were studied. Faulty operation of the air brake would be a most likely cause. If it were the sole cause, the condition would exist on all the wheels on a car rather than on only one or two pairs, which now seems to be more prevalent. While the number of wheels removed from WCLX cars for these causes has not been large, the decrease in cut-journal wheels has focused attention on them.




**Relation between known shoe replacements at "high" and "low" positions illustrates the effects of uneven wear pattern.**

| Month of service | Mileage operated | R-1 | L-1 | R-2 | L-2 | R-3 | L-3 | R-4 | L-4 | Position unknown | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1957 | | | | | | | | | | | |
| 1. June | -- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2. July | -- | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 4 |
| 3. Aug. | -- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 5 |
| 4. Sept. | -- | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 3 |
| 5. Oct. | -- | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 6. Nov. | -- | 1 | 0 | 2 | 2 | 0 | 1 | 1 | 1 | 6 | 14 |
| 7. Dec. | -- | 0 | 0 | 0 | 1 | 1 | 1 | 3 | 0 | 10 | 16 |
| CUMULATIVE | 8,711,180 | 1 | 3 | 2 | 3 | 1 | 4 | 5 | 2 | 23 | 44 |
| 1958 | | | | | | | | | | | |
| 8. Jan. | 1,218,454 | 0 | 1 | 1 | 2 | 0 | 1 | 1 | 1 | 4 | 11 |
| 9. Feb. | 1,115,069 | 2 | 4 | 3 | 3 | 1 | 9 | 2 | 2 | 22 | 48 |
| 10. March | 1,334,547 | 4 | 10 | 7 | 6 | 3 | 8 | 13 | 5 | 25 | 81 |
| CUMULATIVE | 12,379,250 | 7 | 18 | 13 | 14 | 5 | 22 | 21 | 10 | 74 | 184 |
| 11. April | 1,210,011 | 5 | 19 | 18 | 9 | 8 | 20 | 21 | 12 | 32 | 144 |
| 12. May | 1,322,850 | 13 | 38 | 30 | 20 | 16 | 28 | 30 | 14 | 23 | 212 |
| 13. June | 1,166,393 | 28 | 49 | 38 | 26 | 35 | 59 | 53 | 34 | 35 | 357 |
| CUMULATIVE | 16,078,504 | 53 | 124 | 99 | 69 | 64 | 129 | 125 | 70 | 164 | 897 |
| 14. July | 1,088,025 | 26 | 36 | 47 | 25 | 31 | 31 | 45 | 35 | 41 | 317 |
| 15. Aug. | 1,156,985 | 20 | 32 | 31 | 22 | 22 | 32 | 30 | 22 | 34 | 245 |
| 16. Sept. | 1,132,187 | 40 | 53 | 32 | 36 | 47 | 39 | 34 | 37 | 45 | 363 |
| CUMULATIVE | 19,455,701 | 139 | 245 | 209 | 152 | 164 | 231 | 234 | 164 | 284 | 1,822 |
| 17. Oct. | 1,227,399 | 32 | 39 | 38 | 29 | 25 | 25 | 32 | 24 | 45 | 289 |
| 18. Nov. | 1,444,790 | 20 | 19 | 26 | 25 | 23 | 23 | 29 | 16 | 33 | 214 |
| 19. Dec. | 1,199,546 | 29 | 22 | 22 | 27 | 31 | 34 | 28 | 30 | 32 | 255 |
| CUMULATIVE | 23,027,436 | 220 | 325 | 295 | 233 | 243 | 313 | 323 | 234 | 394 | 2,580 |
| 1959 | | | | | | | | | | | |
| 20. Jan. | 1,317,466 | 28 | 27 | 26 | 27 | 14 | 26 | 19 | 19 | 31 | 217 |
| 21. Feb. | 1,206,515 | 24 | 18 | 21 | 17 | 18 | 16 | 22 | 25 | 37 | 198 |
| 22. March | 1,389,590 | 10 | 15 | 15 | 13 | 19 | 11 | 16 | 22 | 28 | 149 |
| CUMULATIVE | 26,941,007 | 282 | 385 | 357 | 290 | 294 | 366 | 380 | 300 | 490 | 3,144 |
| 23. April | 1,273,275 | 20 | 16 | 23 | 16 | 16 | 22 | 24 | 21 | 2 | 160 |
| CUMULATIVE | 28,214,282 | 302 | 401 | 380 | 306 | 310 | 388 | 404 | 321 | 492 | 3,304 |

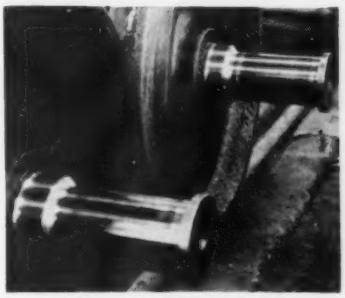
**Replacement records for brake shoes on 800 WCLX refrigerator cars have brought line's officers to opinion that today's brake rigging may produce uneven braking forces.**

Cut journal removals on 800 new steel refrigerator cars, including the 400 on the brake-shoe replacement study, totaled four in 48,500,000 miles through May 1959. Eleven wheel sets were removed for built-up tread. It may indicate that the built-up tread will replace the cut journal as the principal cause for wheel removal. This does not imply that the hot-box problem is completely solved, but only that it has been controlled, permitting review of wheel removals in a new perspective. This can only be determined after more data are available.

Wheel maintenance is one of the most costly items in car maintenance. The ability to operate wheels for only a small percentage of their full service potential indicates to Wilson the need for further work. The ideal would be to get full potential service from all wheels at a uniform wear rate in all locations so wheels could be changed by complete car sets.

Certain conditions seem to be reasonably well established, but should be verified through further study. Other possible related effects include brakehead, brake-beam, bolster and sideframe wear, journal bearings, and wear on brake levers, rods, connection pins and cotter keys. Wilson will continue its study on brake-shoe replacements with the expectation that the material developed and evaluated may eventually be utilized not only on WCLX cars, but perhaps on freight equipment generally.

# Journal Stops and Pads Make Good Record



Journals from car showed highly polished surfaces when bearings were removed.

Bearing, stops and wedge from WCLX could go back on car after 58 months of service.

Six of eight of these Jeffers lubricators could be reused following renovation.

Prior to the investigation of brake shoe replacements reported above, Wilson was studying the benefits to be derived from the use of journal stops and lubricating pads. Five cars were fitted with R-S stops and pads in 1954. They have operated over 1,000,000 miles in the past 58 months, and are still equipped with most of the bearings and all the stops originally installed.

The Jeffers lubricators installed in 1954 were replaced with the bolted type in 1956. During the past year, there were two cut journals reported for these cars—the first since they went into service five years ago.

Recently, one of the five—WCLX 9592—was inspected after 194,633 miles. All its Satco-lined bearings were found serviceable and were reapplied. The wedges, also returned to service, were found in good condition with adequate lubrication.

The bearings had uniform and parallel contact on the journal. In some instances, considerable force was required to break the oil film so the bearing could be removed, indicating substantial surface contact. Fillet end wear of up to 1/16 in. was reported, but this may have been caused by the use of second-hand axles and standard bearings in the original installation. A recent check of some of 300 car sets of prewar length bearings applied to new WCLX cars in 1957 showed no evidence of wear on the fillet.

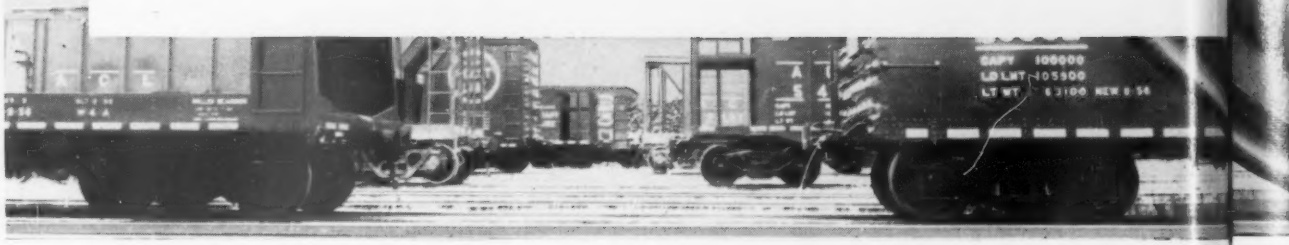
Maximum wear on the faces of the inside R-S journal stops was 1/16 in. and was 1/32 in. on the faces of the outside stops. A few of the cap bolts were loose. All stops were reapplied. Six of the eight Jeffers lubricators installed in January 1956 were cleaned and put back. Lubricators in two boxes were renewed because of torn felt, probably caused by a pointed packing iron.

There was evidence of loss of oil from the rear of all the boxes. The rubber dust guards appeared to be in good condition, except for one at the L-1 location which had a torn bellows.

The one-wear wheels, originally installed, were allowed to continue in service. Tread wear ranged from 5/16 to 7/16 in. As a result of the inspection, Wilson officer believe bearing life on the five cars can be expected to equal wheel life. This is further backed by the performance of the 800 cars reported in the above article. Through last May, they had averaged only one cut journal each 12.1 million car-miles —an increase of 2.1 million car-miles over the figure reported for them for the previous year's service. Wilson believes restraint of the journal movement goes hand-in-hand with good journal bearing performance.

# Performance record proves:

# Timken® Bearings eliminate the hot box problem!



The performance record of Timken® tapered roller bearings in service on America's railroads proves they cure the hot box problem—No. 1 cause of freight train delays. Here are the facts: Since 1954, Timken "AP" journal bearings have averaged 136,000,000 car-miles per failure due to overheating—*500 times friction bearing average car mileage.*

You get this performance because:

**1.** Timken journal bearings are *tapered* which gives them the ability to take radial as well as thrust loads. There is no more economical way to get high load-carrying capacity in a bearing.

**2.** *They're made of nickel-rich steel* to make them tough. We make this steel ourselves.

**3.** *Sixty years of manufacturing experience* built a new plant in Columbus, Ohio, devoted exclusively to the production of Timken "AP" railroad bearings. New highs in uniform quality and precision, achieved here, assure top performance.

**4.** *More than 25 years experience* working directly with railroad operating people has given us the engineering know-how to give railroads the trouble-free performance they need.

When you buy or build cars, specify Timken "Roller Freight" and get *more*—starting right now—from your freight car investment. 86 railroads and private car owners now have over 42,000 "Roller Freight" cars in service or on order. "Roller Freight" is rolling. The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

*See us at the Allied Railway Supply Exhibition—Hotel Sherman—Chicago, September 20 to 23. Booths 127-131, 136-140.*

**BETTER-NESS rolls on**

# TIMKEN®

**tapered roller bearings**

Quadruple hopper openings and 35-deg slopes facilitate rapid unloading of wood chip ladings at paper mills. Overhead or side-mounted car shakers can be used to assist in the unloading operations. Car sides are relatively light gage material because only lading will be chips.

# ACL Builds Big Wood-Chip Hoppers

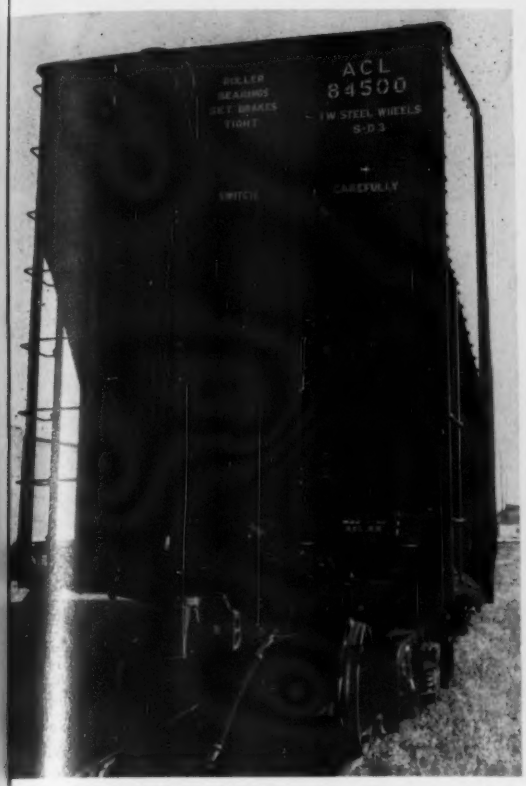
THE ATLANTIC COAST LINE, by the end of September, will complete construction of 200 giant-size, 70-ton, wood-chip hopper cars at its Waycross, Ga., shop. Over the past six years, demands for the movement of steadily increasing volumes of wood chips have confronted all the Southern railroads. The ACL has found its new wood-chip car design has evoked considerable enthusiasm with the pulp and paper industries in the territory it serves.

The design provides for a high-sided, 50-ft, quadruple-hopper car with a capacity of 5,400 cu ft, capable of handling 70 tons of wood chips. It is an all-riveted car equipped with standard trapezoidal hopper doors. Hopper slope sheets are 35-deg, and are coated with an acrylic paint having an added slip agent to provide slippery interior surfaces and simplify unloading. Overall dimensions, except for height, are within latest standard AAR clearances; and the safety appliances all comply with current ICC regulations.

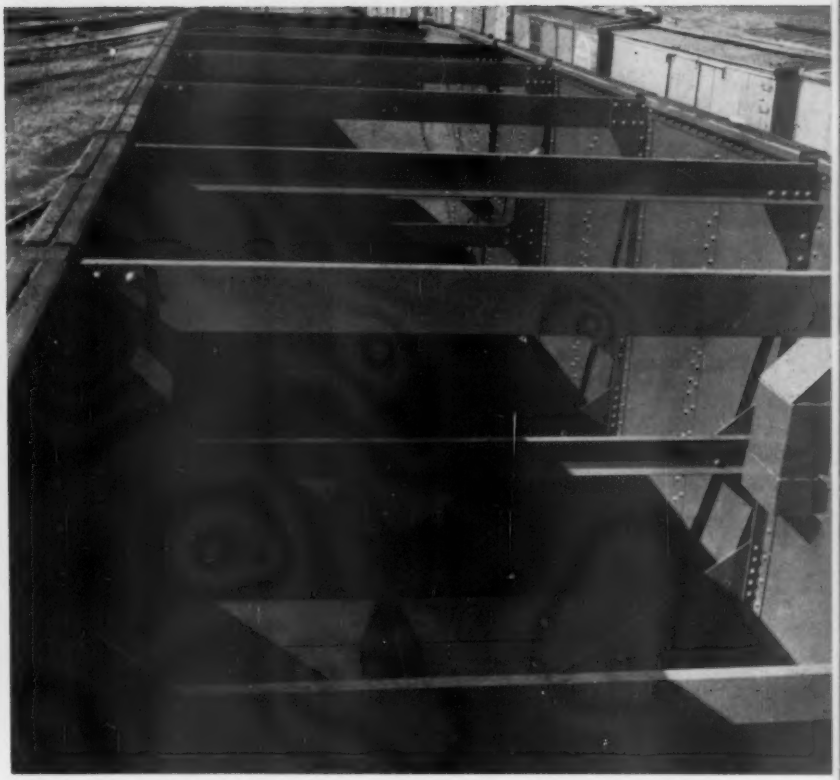
Jumbo-sized 5,400 cu ft chip car dwarfs one of ACL's standard hopper cars previously used for wood chip movement. Several Southern roads have been building special cars for chip service.

The cars were designed by the ACL's mechanical department under the direction of H. J. Stein, assistant general superintendent motive power and equipment, and J. W. Hawthorne, chief mechanical officer. They were assembled on a ten-station production line in Waycross at a two-cars-per-day rate. All of the materials for these cars, except the body brake levers and brake rods, were fabricated by specialty suppliers and shipped to Waycross for assembly.

Because this car was designed solely for the wood-chip handling job, it was possible to use No. 8 gage special depressed side sheets, ¼-in. floor sheets and 5/16-in. hopper chutes in place of the heavier materials usually applied to coal-handling hopper cars.




Overall height of 15 ft 3 in. gives chip car unusual appearance but provides 5,400 cu ft capacity.



Open top is braced by deep bolsters, crossties and crossridges, and by two rows of channel ties. Tee section top rails are reinforced by U-shaped pressings.

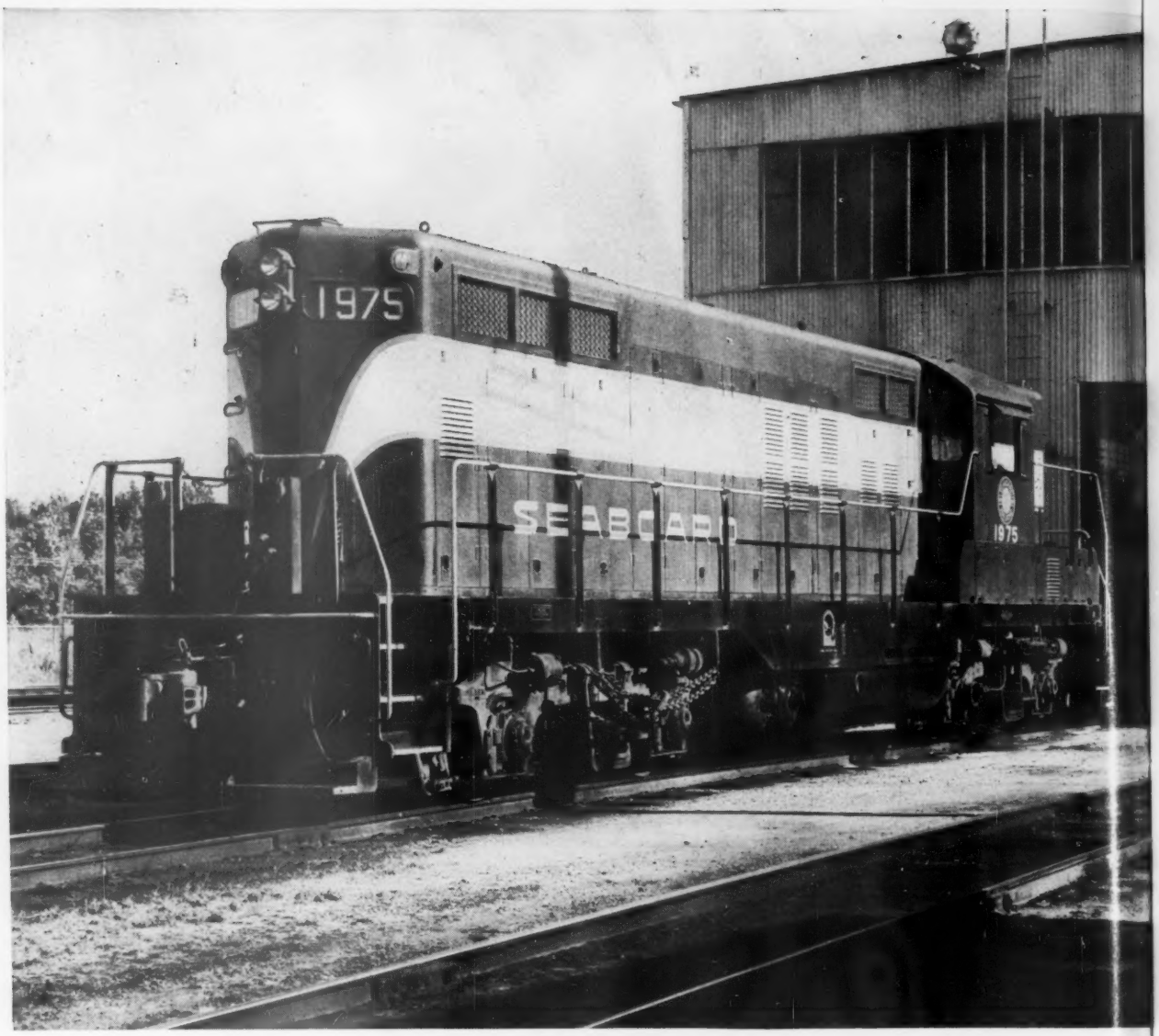
### Partial List of Materials and Equipment

| | |
|---|---|
| ACF Industries | Draft keys, hinge and brake pins, roping staples |
| Alcatraz Co. | Car cement paint |
| Alco Products, Inc. | Truck springs |
| Allied Steel Castings Co. | Body center plates |
| American Brake Shoe Co. | Cast-steel wheels and Lockeys |
| American Steel Foundries | Truck frames and A-3 Ride-control parts |
| Bayonne Bolt Co. | Truck pedestal bolts |
| Bethlehem Steel Co. | Roller-bearing axles |
| Bigelow Varnish Co. | Acrylic paint |
| Buckeye Steel Castings Co. | Combined striker and front draft lugs; truck frames and bolsters |
| Buffalo Brake Beam Co. | Unit brake beams and wear plates |
| Camel Sales Co. | All car-body parts, including floor sheets, body bolsters, crossridge sheets with body sides preassembled |
| Cardwell-Westinghouse Co. | Draft gears |
| Central Railway Supply Co. | Cotter locks and guards |
| Dearborn Chemical Co. | No-Oxide red "C" filler |
| Dresser Manufacturing Div. | Brake-pipe fittings |
| Elastic Stop Nut Corp. | Elastic Stop Nuts |
| Erie Malleable Iron Co. | Push pole pockets |
| Glidden Co. | Zinc chromate primer |
| Greenville Steel Car Co. | Center sills, handholds, hopper sheets and hoods |
| Gustin-Bacon Mfg. Co. | Retainer pipe clamps |
| Illinois Railway Equipment Co. | Pipe clamps and T-anchors |
| Miller, Henry, Spring & Mfg. Co. | Truck springs |
| Miner, W. H., Inc. | Draft gears and hand brakes |
| Motor Wheel Corp. | Defect card holders |
| National Malleable & Steel Castings Co. | Truck bolsters, roller-bearing adapters, and draft gears |
| Pittsburgh Forgings Co. | Coupler wearing plates |
| Railway Devices Co. | Brake jaws |
| S K F Industries, Inc. | Journal roller bearings |
| Schaeffer Equipment Co. | Truck levers, bottom rods and cylinder push rods |
| Scullin Equipment Co. | Truck frames |
| Standard Railway Equipment Mfg. Co. | Hopper doors and uncoupling devices |
| Stucki Co. | Side bearings and wedges |
| Symington-Could Co. | Truck bolsters and center-sill fillers |
| Union Spring & Mfg. Co. | Truck springs |
| U.S. Gypsum Co. | Brake steps |
| Waugh Equipment Co. | Draft gears |
| Westinghouse Air Brake Co. | Air brakes |
| Wine Railway Appliance Co. | Hopper door frames, hinges and latches |

The center sill is composed of two 51.2 lb, AAR Z-sections.

Five transverse ties across the top of the car are formed from 7-in. structural channels. These ties, along with ⅜-in. cross-ridge web plates, help to withstand the operation of car shakers used to expedite unloading operations. At two points on each side, the car assembly has been reinforced to permit the application of side-mounted car shakers. Top chords of the car body are 5-in. structural tee sections. U-shaped steel reinforcements are applied to these chords, riveted at the vertical leg and welded on the horizontal leg of the tee section. This arrangement is designed to withstand the operation of overhead-type car shakers.

Overall height of the car is 15-ft 3-in.; the inside length is 50-ft 9¾-in.; and inside width is 10-ft 3¾-in. Light weight of the completed car is 71,000 lb. As is its practice with all new freight equipment, these ACL wood-chip cars are equipped with ACL-design, AAR-approved roller-bearing trucks which have pedestal openings that allow application of any standard solid or roller journal bearing assembly.




Pulling out of the Savannah shops of Seaboard Air Line Railroad is No. 1975, one of Seaboard's 69 locomotives whose engines operate with Gulf Dieselmotive oil.

## 300,000 test miles prove Gulf Dieselmotive oil keeps engines

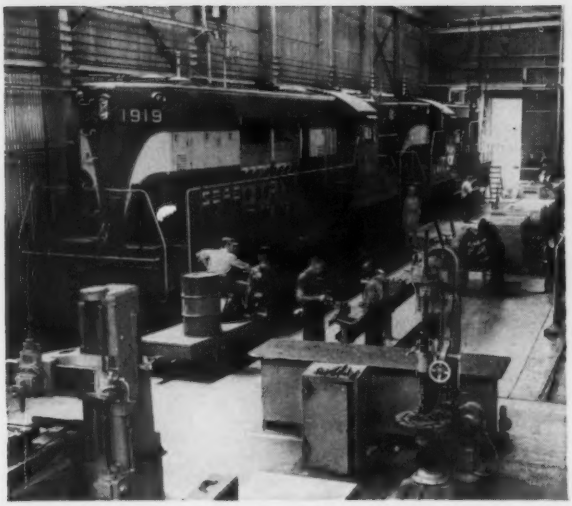
# GULF MAKES THINGS

Ask C. O. Johnson, Chief Test Engineer of the Seaboard Air Line Railroad, whether Gulf makes things run better. Particularly in the lubrication of heavy-duty diesel freight engines. He checked it out, in a big way.

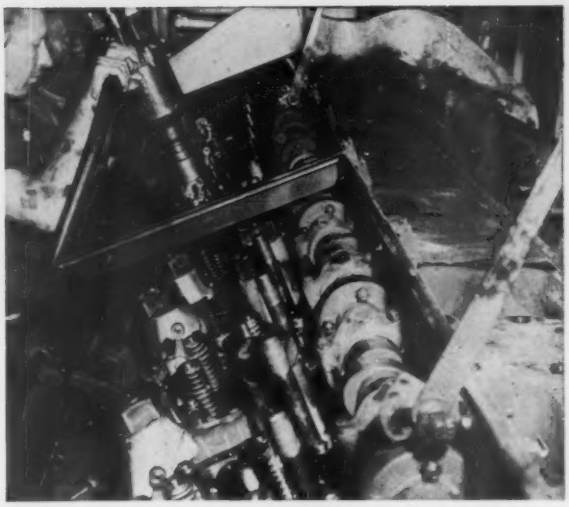
In grueling over-the-road tests which involved 300,000 miles of operation with Gulf Dieselmotive oil, and 200,000 miles with a control oil, Mr. Johnson saw plenty of proof that Gulf Dieselmotive keeps engines running cleaner, and longer between overhauls. Enough proof to cause him to specify Gulf Dieselmotive oil as the preferred lubricant for Seaboard Air Line Railroad's fleet of 69 freight locomotives.

For the test, Mr. Johnson had two power assemblies from each of 5 EMD engines removed. All critical parts were micrometrically measured in the Seaboard test laboratory, then replaced and the engines sealed.

At the end of a year's operation, all 5 engines were torn down and the parts re-examined in the lab. The




This Seaboard locomotive, No. 1919, is having power assemblies changed out after 160,176 miles with Gulf Dieselmotive in the crankcase. During this time, engine oil was changed only once.



Topside view of the power unit in Seaboard's No. 1919 having power assemblies changed out. Using Gulf Dieselmotive, this engine will be good for another 150,000 to 200,000 miles before power assembly change-out is required.

A. T. Cubbedge, Mechanical Foreman at Seaboard's Savannah shops, holds a connecting rod bearing shell from No. 1919. The shell is remarkably free from wear after 160,176 miles of operation with Gulf Dieselmotive oil.

Seaboard Railroad and Gulf work together to insure cleaner engines with Gulf Dieselmotive oil. L. B. Alexander, left, Seaboard Master Mechanic, checks a locomotive at the Savannah shops with Gulf Sales Engineer Joe B. Scott, Jr.

## running longer between overhauls

# RUN BETTER!

most striking test result was the cleaner condition of the engines that were lubricated with Gulf Dieselmotive.

There was a marked decrease in varnish deposits. Where oil had been sludging before, the greater reserve of detergency in Gulf Dieselmotive had kept sludge formation to a minimum.

Your diesel engines can run cleaner and longer on Gulf Dieselmotive oil. Try it—and see how Gulf makes things run better. Call your Gulf office or mail coupon.

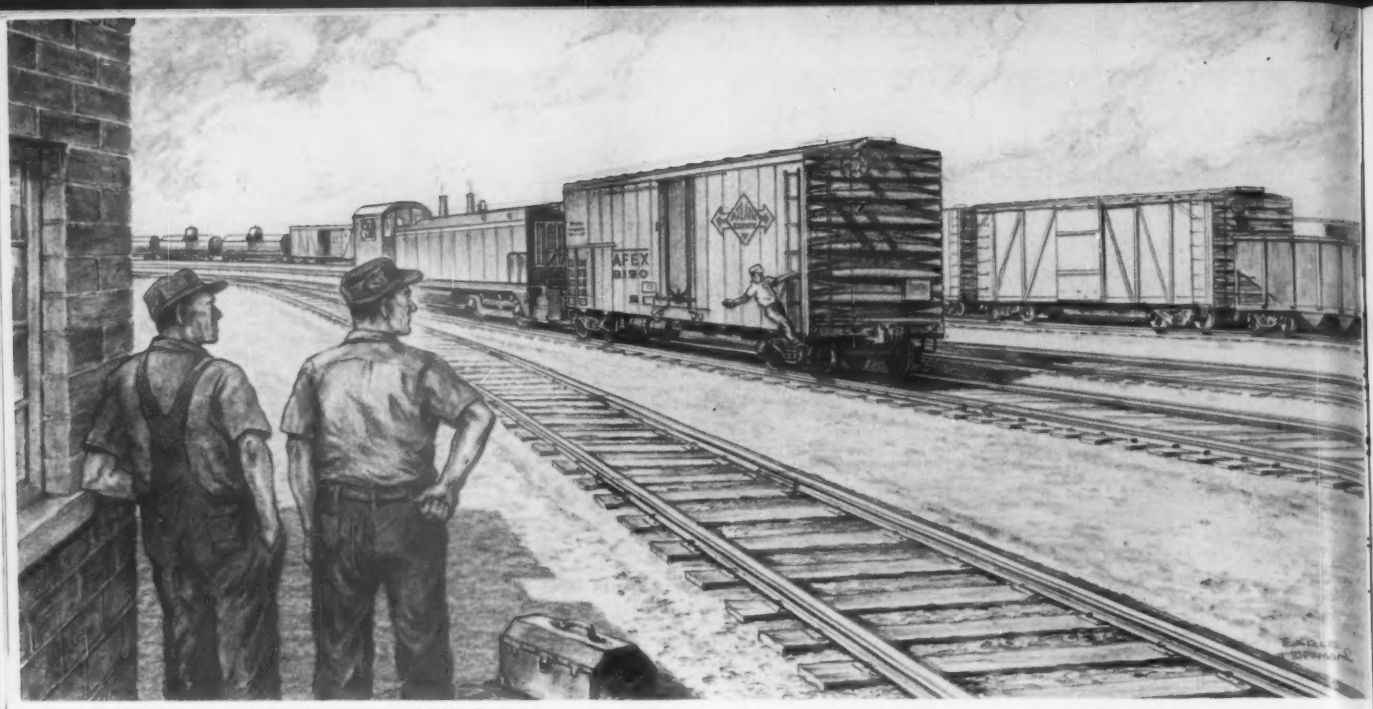
GULF

**GULF OIL CORPORATION**
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Send more information on Gulf Dieselmotive oil.

Name_____
Title_____
Company_____
Street_____
City_____ Zone_____ State_____

RA-5285




At this moment the yard crew arrived with the car.

# Wrong Track

**By Ken Wright**

A GOOD WARM DAY and our friends in the maintenance shop were busy. Big Jim, the boss, came out into the shop with a handful of telegrams. "Hey, Red!" he shouted. As Red came up, Jim said: "You've had some experience with mechanical refrigerator cars, and I'm giving you a chance to see what you've learned." Holding up one message, Jim went on: "This car is in trouble and should be in here soon. I want you to meet the train and see what the trouble is. If you can't fix it readily, call me, and I'll have the car cut out and brought to the shop."

Red picked up the serviceman's tool kit and headed for the yard office. By the time he found which track the train would be on and where the car would be in the train, the train was pulling into the yard. As he approached the car, he could hear the engine running and knew there should be no engine trouble. He then checked the car thermometers, entered their readings in the log book, and noted that the car temperature was higher than it should be.

When he then got into the machinery compartment, he first noticed that the condenser fan was running. He next checked the refrigerant level in the receiver (a single-unit system) and found it normal. Then he checked and found that the compressor motor was not running. Overload breakers could have tripped, or fuses might have blown. In the electric cabinet, he found only breakers; there were no fuses. Red pressed all of the resets, but the compressor did not start. A quick check showed no loose wires.

Feeling he had some sort of electrical trouble, Red decided that the car should be set out. Returning to the car after calling Big Jim, he was checking the electric cabinet again when the compressor motor contactor closed and the compressor started. There was no apparent reason for this. While he was still staring in amazement, the motor contactor opened and the compressor stopped. Poor Red was really confused. He felt the jolt as the switcher coupled on to cut out his problem car. Red got off and started back to the shop to meet it.

When Red reported to Big Jim, his boss replied: "Looks kinda strange. Guess I better get Pete to help you."

Pete usually complained about such assignments. After he had talked to Red and heard his story, however, Pete showed real interest. "You say you think it is something loose in the control circuit?" queried Pete.

"Almost has to be, Pete. Everything else seems to be working. That contactor keeps opening and closing just like a loose connection."

Pete thought that over and asked: "Could it be those automatic overload resets? You know . . . the type that open to break the motor circuit and automatically reset themselves when they cool."

"They act like that, but I'm sure these contactors aren't that type."

"You do know that there were some cars built with that type of overload?" asked Pete.

"No, I didn't know. Do they work?"

"I haven't seen any lately, so apparently designers don't like them too well."

At this moment the yard crew arrived with the car, and Pete said: "Let's look at the wiring diagram be-

*(Continued on page 68)*

This is the seventh article in this series, discussing the operation, maintenance and trouble shooting of mechanical refrigerator cars.

***For Railroad Insulation Requirements . . .***

***the big news for 1959 is***

# JOHNS-MANVILLE FIBER GLASS

With L·O·F Glass Fibers Company joining the Johns-Manville family, your J-M representative can now supply Transulite® fiber glass insulation blanket—developed specifically to meet the requirements of the transportation industry—also a wide range of other fiber glass materials.

**For refrigerator car use**—J-M Transulite fiber glass blanket has a special binder which minimizes moisture pick-up even under the most severe operating conditions. Extremely fine fibers are bonded together with thermo-setting resin into an unusually resilient blanket with these main advantages:

- **Superior thermal performance**
- **Excellent resistance to moisture pick-up from humid atmosphere**
- **Meets flame spread specifications**
- **Light weight and ease of handling**
- **Resists settling or sagging caused by vibration**

Other J-M Fiber Glass insulations, Microlite® and Microtex®, serve in many railroad applications.

In railroads, as in many other industries, buyers of fiber glass products will now be served by an enlarged staff of J-M sales and technical personnel operating out of 56 sales offices . . . by expanded distribution facilities . . . by the addition of 7 strategically located plants and by expanded research and product development of fiber glass products.

Call your Johns-Manville representative or write to Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.

**JOHNS-MANVILLE**

JOHNS-MANVILLE JM PRODUCTS

fore we go any further."

They found the wiring diagram mounted inside the electrical cabinet door encased in plastic.

"My gosh," Red piped up, "couldn't they have made it any smaller? How do they expect us to read that?"

"Now wait a minute, Red! Sure it's small, but it is a clear print and you can read it. It won't get dirty and oil soaked."

"Yeah, I see your point, but wait till the painters get a crack at it." They both had to chuckle over that one.

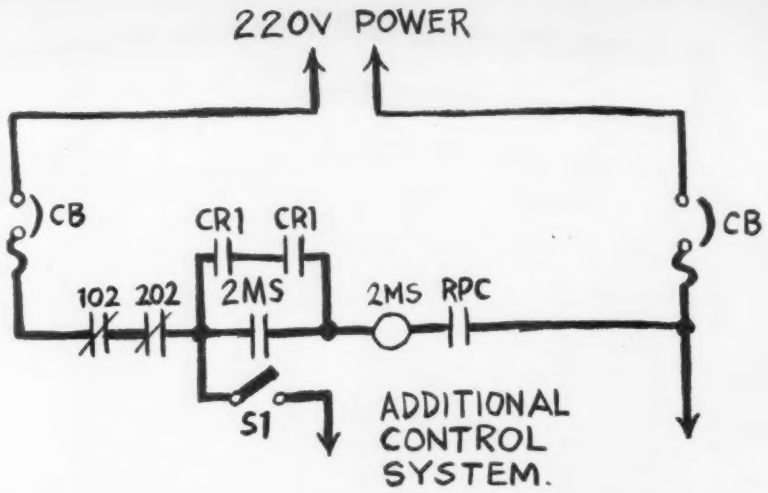
The legend showed "2MS magnetic starter for compressor." The circle on the schematic marked 2MS indicated the coil for this starter. Tracing the circuit out from left to the right, the circuit goes through a circuit breaker (CB) then through No. 1 overload (1OL) and then through No. 2 overload (2OL). Next are two normally open contacts of CRI. CRI is energized by the temperature control panel, if car temperature is such that cooling is needed. The circuit will go through the two CRI contacts to the coil of the 2MS, and then through a normally closed contact of the RPC—Dual Refrigeration Pressure Cutout. That RPC is the "Hi-Lo Switch," or the compressor safety switch.

"Now let's see," Pete said, "you already tried the circuit breakers and the overloads. Here is something interesting, Red. These 10L and 20L contacts are the safety protection on the evaporator fan motor and the compressor motor. If either motor becomes overloaded, one of these contacts will open and break the circuit to all of the control system. Usually overloads only protect or stop that one device, but here everything is stopped, except the condenser fan.

"Now let's see. The 2MS coil is energized through its individual circuit of two normally open contacts of the CRI and the normally closed contact of the RPC. Let's watch and see what the CRI is doing. It's closed or energized—the temperature control panel is calling for cooling. The 2MS contactor is this one here, and it is out or de-energized."

At that moment, the 2MS contactor became energized. The compressor started, ran for about 2 min, and then 2MS dropped out again.

Pete got a little excited. "See that! See that! The CRI did not move. It stayed in during the cycle. That means,




then, that RPC is stopping and starting the compressor, unless we do have a loose connection. Let's get the gages on the system and find out whether it is high discharge pressure or low suction pressure."

Pete allowed Red to apply the gages so that he would gain experience. Suction pressure was found to be normal, while the discharge pressure was 210 psi. This was in excess of normal discharge, or condensing pressure.

Red asked Pete just how he determined that the discharge pressure was excessive. "Well," Pete replied, "in this case it's real easy. The pressure is high enough to be tripping the 'Hi-Lo' switch. You should refer to a pressure-temperature chart. It gives the relationship of pressures and temperatures. If you know the temperature, then the chart will give you the corresponding pressure, or vice-versa.

"In this case the condenser or discharge pressure will be affected by the action of the compressor, or by the suction pressure. That condensing or discharge pressure will be from 8 to 45 psi above the suction pressure and will be related to the temperature of the air passing through the condenser. Where suction pressure is low, then the condensing pressure will only be about 8 psi above the pressure-temperature chart reading. If suction pressure is high—around 30 psi—then the condensing pressure will be about 45 psi above the indication on the pressure-temperature chart.

"As an example," Pete continued "our suction pressure right now is about 1 psi. Take your pocket thermometer, Red, and find out what the outside temperature is."

While Red was doing this, the compressor started and stopped again. The temperature was 85 deg. Pete reached into his pocket and extracted a small card supplied by a manufacturer of refrigerant equipment. On this card was a pressure-temperature chart.

Pete pointed out that the chart showed a pressure of 91.7 psi for a temperature of 85 deg. "For all practical purposes, we can disregard the suction pressure because it's only 1 psi. With that low suction pressure, let's add 8 psi to the chart pressure, giving us 99.7. That means that our condensing pressure should be about 100 psi.

"But we have over 200 psi," Pete pointed out. "That means we have air in the system. Air is a non-condensable gas in any refrigeration system. When it gets in, air moves to the high side, which means the condenser. It stays there because it will not condense at condenser pressures. Condenser size has been carefully calculated with just so many square feet of surface area.

"This is necessary so that the refrigerant vapor will condense on the hottest days. When air gets in the condenser, it takes up space and leaves less for the Freon vapor. To compensate for this, the compressor continues to operate, striving to reach a pressure

*(Continued on page 70)*

**Temperature Pressure Relationship**

| Temp., deg F | Press., psi | Temp., deg F | Press., psi |
|---|---|---|---|
| −20 | 0.58 | 40 | 37.0 |
| −10 | 4.50 | 50 | 46.7 |
| 0 | 9.17 | 60 | 57.7 |
| 5 | 11.18 | 70 | 70.12 |
| 10 | 14.7 | 80 | 84.06 |
| 20 | 21.1 | 85 | 91.7 |
| 30 | 28.5 | | |

*"Leave scratchin' an' peckin' to the chickens —*

## *Use* AIRCO EASY ARCSTARTS!"

The first time you try Airco's new EASY ARCSTART Electrodes you'll never go back to scratchin' an' peckin' with yesterday's electrodes.

Welding mild or low alloy steel, or hardfacing? Airco EASY ARCSTART Electrodes enable you to *use lower amperage for starting, if desired; strike an arc the first time; and do it easier than ever before.*

The tip coating does the trick. This is the cap at the striking end of EASY ARCSTART Electrodes — a special metallic compound that instantly initiates arc current.

Airco EASY ARCSTART Electrodes are available in diameters from 1/16" to 5/32"... for mild steel, low alloy steel and some hardfacing electrodes.

AIRCO®

**AIR REDUCTION SALES COMPANY**

**A division of Air Reduction Company, Incorporated**
**150 East 42nd Street, New York 17, N.Y.**

**On the west coast—**
Air Reduction Pacific Company
**Internationally—**
Airco Company International
**In Cuba—**
Cuban Air Products Corporation
**In Canada—**
Air Reduction Canada Limited

All divisions or subsidiaries of Air Reduction Company, Inc.

that will cause the vapor in the condenser to condense. As more air enters the system, the compressor will raise the pressure still further. Finally, with a combination of higher ambient temperature and a large volume of air in the system, the condensing or discharging pressure will reach the setting of the 'Hi-Lo' switch and stop the compressor. This is the condition that we now have."

"How did the air get in the system and what do we do about it?" asked Red.

"The air entered through a suction leak. We'll find it and make repairs, if possible. Then we will either evacuate the system with a pump, or purge the air out. Purging the air is not a permanent solution because, when air enters the system, moisture also enters. Get the Halide leak detector and let's see if we can find that leak," Pete concluded.

While they were checking for the leak, Red asked: "Isn't there a more positive way of determining if there is air in the system?"

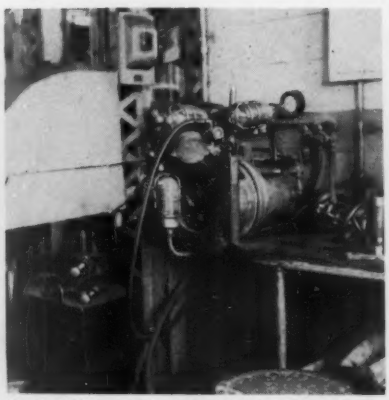
"Yes, there is," answered Pete, "but not under this particular situation. Because this car is loaded, we can't use the best method. The system should be shut down to allow all parts to reach normal temperatures. Then, if the pressure of the system exceeds 10 psi above the chart pressure, it indicates air in the system. We can't allow the evaporator, which is inside the cargo space to warm up to ambient."

A leak was discovered at the compressor shaft seal. Because this was an open type compressor, there is a seal around the crankshaft where it extends through the compressor housing. The motor is outside and drives the compressor through a flexible coupling. With a failure of this seal, refrigerant and oil escape as long as there is a positive pressure on side. When suction pressure does become a vacuum while the system pumps itself down before cycling off, air is drawn in through the defective seal.

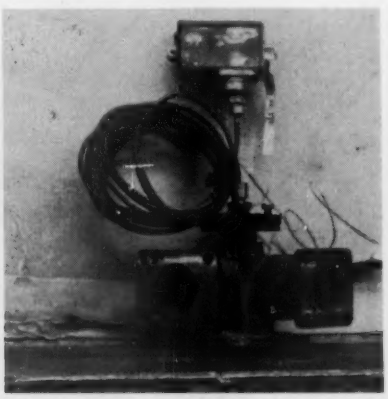
"The important thing right now is to do something with this car," Pete said. "Let's purge some air so the equip-

*(Continued on page 123)*

# Diesel Repair Time Savers



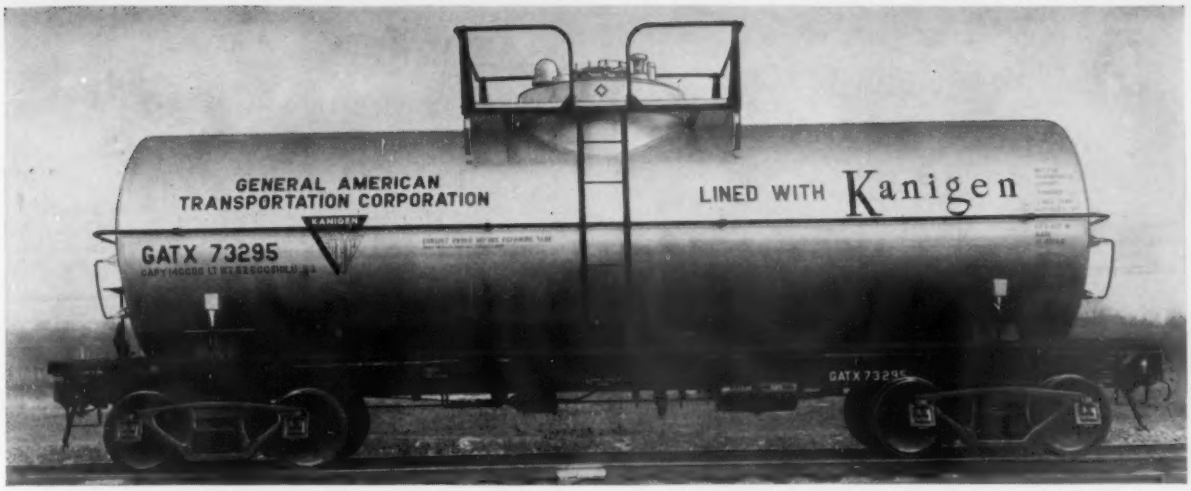
Test stand used by the Soo Line at its Shoreham shop in Minneapolis, tests EMD B and C cylinder heads for leaks. Water at 50 to 70 psi and 200 deg F is used. An additional fixture attaches to C heads to block off the side ports in the top. Lights make possible inspection of exhaust and valve cavities after head is turned 90 deg.



Adapter, made of two plates, makes it possible to clamp hot-engine alarm thermostat instead of screwing it into manifold on F-3 of Chicago & Eastern Illinois. Cable does not kink or break.

Tool tray, developed by Duluth, Missabe & Iron Range, holds many tools required in diesel repair operations. Tray hooks to the rail of diesel within easy reach. It eliminates bulging pockets and makes unnecessary trips to lockers for additional tools.

Plastic covers are used by the Milwaukee Road at its Milwaukee shop to cover and protect new and reconditioned engines and generators. Elimination of canvas covers makes identification easy and discourages the borrowing of parts for use on other engines.




# A tank car protects product purity with a low-cost Nickel plated lining

*Special Kanigen process deposits chemically a hard, uniform corrosion-resisting Nickel coating on inexpensive materials*

Kanigen* Nickel Plating gives low-cost metals a hard, even surface that withstands abrasion and corrosion – and prevents product contamination.

It can be used on light metals such as aluminum, permitting the use of lighter equipment. And it has been successfully used on irons, coppers, sintered metals, thermo-setting plastics, glass and ceramics.

You'll find these Nickel coatings not only on tank cars, but on valves, pumps, pressure vessels, filters, heat exchangers, shafts, gear housings, and piping.

Kanigen Nickel coatings can give your equipment low-cost protection against corrosion and wear, can protect the purity of the commodities being shipped. The booklet, "Practical Answers to 40 Practical Questions About Nickel Plating," will give you more information about Nickel plating and its many applications. It's yours for the asking from INCO.

*Trademark General American Transportation Corporation, Chicago, Ill.

**THE INTERNATIONAL NICKEL COMPANY, INC.**

67 Wall Street INCO New York 5, N. Y

# INCO NICKEL

**NICKEL MAKES ALLOYS PERFORM BETTER LONGER**

**Burlington fast freight** with new red, white and gray styling is a spectacular sight as it heads west on its 23-hour, 1000 mile run from Chicago to Denver. New General Motors 2400 hp turbo-charged SD-24 Diesels are the most powerful freight units built by Electro-Motive.

**Sixteen** of the powerful new Diesels have been purchased by the Burlington for fast, heavy tonnage hauls. The SD-24 was specially designed for this type work—its low axle loading and high tractive effort provide rapid acceleration and ability to maintain high constant speeds.

# New Turbo-charged Diesels Speed Burlington Freight

## Four General Motors 2400 hp SD-24's do the work of five road units

On the Burlington's accelerated freight service between Chicago and Denver, four new 2400 hp turbo-charged Diesels are bettering the work of five 1750 hp road units. Eliminating one unit is a savings, but swing aboard this daily fast freight and watch how these new General Motors Diesels effect other savings.

**1000 miles, 23 hours.** To accomplish the fast run with a long train, the Burlington needed plenty of power. With the new four-unit consist, there's a far better showing of acceleration and ability to maintain constant high speed than with the previous five-unit consist.

**No fuel stops.** Though horsepower is up, fuel consumption is down. The Electro-Motive designed turbo-charger, plus a new needle valve injector, cuts specific fuel consumption substantially (9% lower than the former units). Fuel savings, plus a larger fuel capacity, make it unnecessary to stop for refueling during the 1,000 mile Chicago to Denver trip.

**Lower maintenance.** Unit elimination cuts maintenance hours considerably, but more than that, the new SD-24's—like all the new General Motors locomotives—contain more than thirty maintenance-reduction items. Scheduled man-hours of maintenance have been reduced at least 60 per cent.

**Power for the future.** The new turbo-charged SD-24 and GP-20 locomotives provide railroads with power to match present accelerated freight schedules with a minimum number of units. Their increased capacity permits scheduling *now* of future plans for even higher ton-miles per trainhour.

See your Electro-Motive representative. He can give you details on any of the great new General Motors higher capacity, lower maintenance locomotives. He can also tell you how you can have the advantages of these new Diesels at less than new unit cost through Electro-Motive's expanded Locomotive Renewal Program.

**The SD-24 is equipped** with the new General Motors 567D-3 turbo-charged engine which maintains maximum engine output over a wide range of altitudes. First to use the new SD-24, the Burlington was first in the United States to introduce the Diesel-powered streamlined passenger train, the Pioneer Zephyr, also powered by Electro-Motive, 25 years ago.

**ELECTRO-MOTIVE DIVISION**
**GENERAL MOTORS** · LA GRANGE, ILLINOIS
*Home of the Diesel Locomotive*
In Canada: General Motors Diesel Limited, London, Ontario

GENERAL MOTORS LOCOMOTIVES

*Now is the time for a giant stride in motive power . . .*

1800 hp General Purpose GP-18 | 1800 hp Special Duty SD-18 | 2000 hp General Purpose GP-20 | 2400 hp Special Duty SD-24 | 1325 hp Road Switcher RS-1325

# NOW! a standard warranty on Westinghouse ReManufactured* "AB" Freight Brake Equipment

Thousands of sets of "AB" Freight Brake Equipment have been completely ReManufactured in our shops during the last few years. Now it is possible to offer to the railroad industry standard warranty on all "AB" Freight Brake Equipment that is ReManufactured in Westinghouse Air Brake facilities.

All "AB" valves, reservoirs and cylinders returned to the Westinghouse Air Brake factory under this program are ReManufactured to meet standard warranty. ReManufacturing includes rebushing, replacement of gaskets and parts of the latest design and complete modernization to conform to present-day standards. All reservoirs are cleaned, assembled with new gaskets and pressure tested as required by AAR regulations and all castings are rustproofed.

**Ship Your Used "AB" Freight Brakes To Us—**
**We ReManufacture Them To Standard Warranty**

**Items to be Returned to Westinghouse for ReManufacture**

- **AB Valve with**
  †Service Portion Body
  Having Filter Protection
  for Charging Chokes
- **AB Reservoir**
- **AB Brake Cylinder having**
  †Non-Pressure Head with
  Spring Guide

†Mandatory for new or rebuilt cars

+

**New Material Furnished by Westinghouse**

- **AB Valve Accessories**
  Vent Protector
  Release Valve Handle
  Details
- **Brake Pipe Details**
  Dirt Collector
  Cut-Out Cock
  Brake Pipe Tee
  Wabcoseal® Angle Cocks
  Hose and Couplings
- **Release Control Retainer**
- **Wabcoseal® Fitting Kit**

=

**We Return to You**

Complete "AB" Equipment with Standard Warranty

**Immediate and Long-Term Advantages In "AB" ReManufacture**

IMMEDIATE

Eliminates need for expansion in shop facilities with accompanying increase in expense burden as need for maintenance increases.

Eliminates investment in equipment for pressure testing of reservoirs, now required under code regulations.

Automatically restores new bushing condition and absorbs rebushing costs inevitable after long service.

LONG TERM

Upgrades brake equipment for reliable operation through the recently extended 4-year cleaning period.

Minimum maintenance repairs required at succeeding cleaning periods.

It will pay you to investigate the advantages of having Westinghouse ReManufacture your "AB" freight brake equipment. You will find our charges for this service compare favorably with real costs for your own shop reconditioning and, in addition, you receive your ReManufactured air brake equipment with a standard warranty.

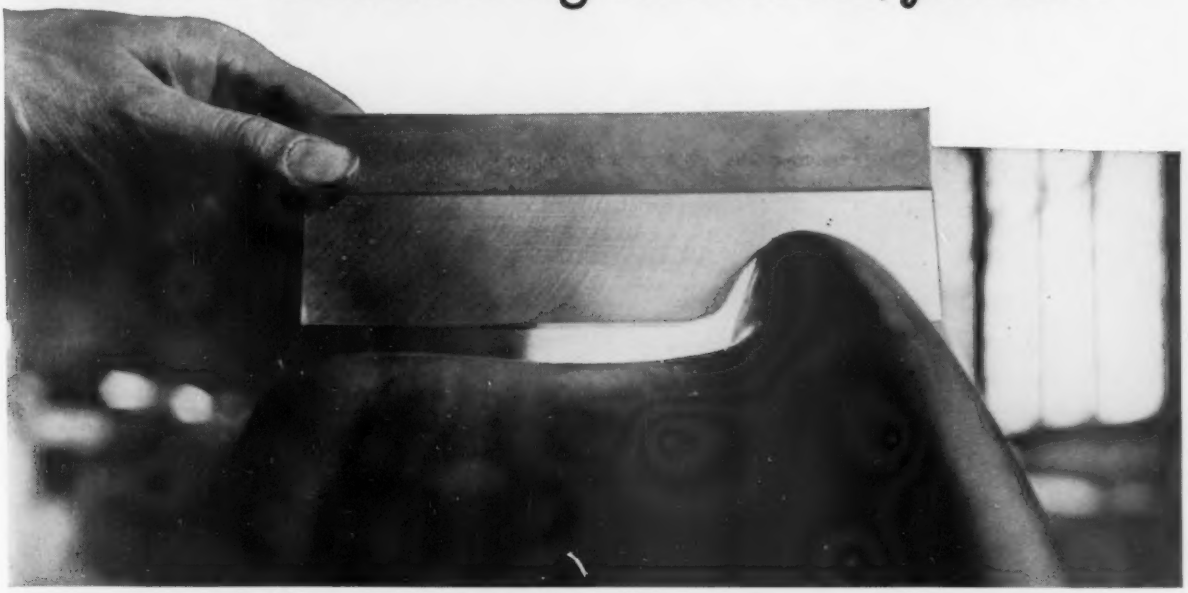
For information on costs and literature, call or write your Westinghouse Air Brake Representative.

---

**"ReManufacturing" is the term Westinghouse Air Brake uses to describe an air brake rebuilt in the same plant under the same strict quality control conditions that prevail during original manufacturing. ReManufacture is the only way of upgrading "AB" Equipment to standard warranty.*

Westinghouse Air Brake
COMPANY
AIR BRAKE DIVISION WILMERDING, PENNA.

# Instead of condemning this wheel, you can--



# TURN IT INTO THOUSANDS OF EXTRA MILES OF LIFE

Of all the freight car wheels that hit the scrap pile, about 60 pct are condemned because of thin flanges. But with Bethlehem one-wear wrought steel wheels, you can usually gain thousands of extra miles of wheel service—by the simple process of turning new tread and flange contours on a wheel lathe. That's because Bethlehem wheels generally have more than enough metal in the rim to permit turning and still meet AAR Interchange Rules.

*Caution:* The Rules do not permit turning of *all* types of wheels. To be on the safe side, standardize on Bethlehem one-wear wrought steel wheels. That will put you on the side of true economy too; the extra life gained by wheel-turning far outweighs any small price differential with cheaper wheels which cannot be turned.

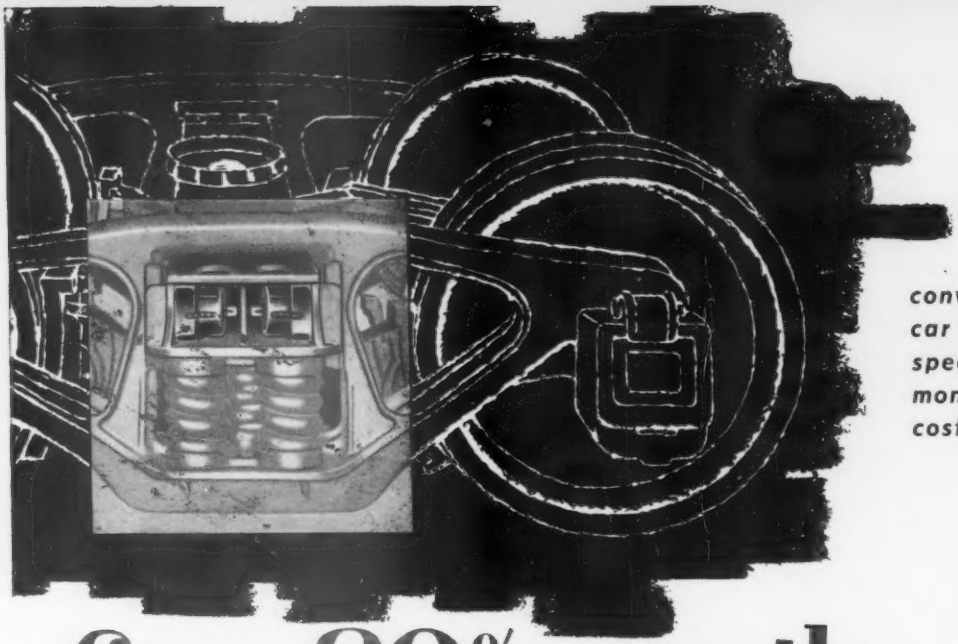
When you're concerned with economy and quality, why not get both? And you can, with Bethlehem wrought-steel wheels. You can buy them with assurance.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

*Export Distributor:* Bethlehem Steel Export Corporation

**BETHLEHEM STEEL**

BETHLEHEM STEEL

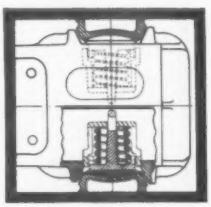


*convert old freight car trucks to high speed service this money-saving, cost-cutting way!*

# Save 80% over the cost of new Freight Car Trucks

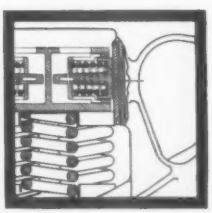
## *with the NEW HOLLAND RIDE STABILIZER RS-2*

NEW



New Large control spring for full face pressure, longer life.

NEW



New Center Retention Means for simplified assembling and dismantling.

There's no need to let those serviceable old Freight Car Trucks be limited to slow speed service when you can convert them to profitable operation at a fraction of the cost of new trucks... The Holland Ride Stabilizer RS-2 has proven to give the same high-speed, lading-protecting, easy-riding characteristics you get in new, costly freight trucks.

You can convert any bolster of A. A. R. approved design and stabilize the ride laterally, vertically and longitudinally... The direct spring loaded control system of the Holland RS-2 **does not** cause uneven wear of the Journal Bearing when abnormal forces are exerted. Wedge made pressures just **do not** occur. Installation of the RS-2 components is unusually simple... And Holland Engineers will give you on-the-job assistance.

Write or call for the new Tell-All Bulletin RS-2.

← RS-2 Spring cushioned pressures do not disturb load distribution on the journal.

← Wedge made pressures disturb load distribution on the journal.

## Holland Volute Snubber Springs

Either 2½" or 1⅜" Spring Travel.

STYLE E-2 Volute Snubber Spring, 2½" Travel in 50 Ton Group.

Upgrades ride by introducing an unusually smooth snubbing action with an exceptionally high load carrying capacity. Holland's principle of utilizing the sliding action of telescoping radially compressed coils with ample friction area eliminates the "bombarding" problem. 518RA

**HOLLAND COMPANY**

332 S. MICHIGAN AVE. • CHICAGO 4, ILLINOIS

***for the finest in freight car truck controls!***

**See us at Booths 132 to 135, Allied Railroad Convention, Chicago—September 20-23**

T. T. Blickle, Chairman
Committee of Coordinated Associations
(Gen. Mgr., Mech. Dept., AT&SF)

W. T. Rice, ACL President,
Guest speaker at the
Coordinated Associations luncheon

G. L. Green, President
Allied Railway Supply Association
(Vice-Pres., Pullman-Standard Division)

# Chicago Convention Opens Sept. 20

Registration for the 1959 meetings of the Coordinated Mechanical Associations and the exhibits of the Allied Railway Supply Association will open in Chicago at noon, Sunday Sept. 20. In addition to displays in the Exhibit Hall at the Hotel Sherman, this year's Allied exhibit will feature a track display area just north of the Illinois Central's Suburban Station. Both exhibits will be open through Wednesday, Sept. 23. Bus service will be operated between the Sherman and the track exhibit at frequent intervals.

Meetings of each of the Coordinated Associations will begin at 10 a.m. Monday, Sept. 21, and will continue through Wednesday. To permit inspection of the Allied exhibits, there will be no sessions on Tuesday afternoon.

The annual Coordinated Associations luncheon will be held on Tuesday, at 12:30 p.m. in the Grand Ballroom. W. T. Rice, president of the Atlantic Coast Line, will be the speaker.

Presidents of the individual associations for this year are: Air Brake—L. A. Stanton, Great Northern; Car Department Officers—K. H. Carpenter, Lackawanna; Locomotive Maintenance Officers—E. V. Myers, Cotton Belt; and Railway Fuel and Operating Officers—C. R. Patterson, Canadian National.

## Air Brake Association—*Crystal Room*

### *Monday—September 21*

**10 am**

President's address
Secretary's report
Committee appointments.

Address—E. K. Bloss, director research and development, Boston & Maine.

A More Effective Air Communicating Signal System for Longer Passenger Trains.

Further Progress with On-Tread Composition Brake Shoes—Montreal Air Brake Club.

Planning for Effective Air Brake Training—Manhattan Air Brake Club.

New AB Valve Condemning Gages and Flowrator Meter Ring Leakage Tests on the AB Test Rack—Pittsburgh Air Brake Club.

**2 pm**

Joint Meeting with Railway Fuel and Operating Officers Association.

Address—W. C. Bowra, general manager, Central Region, Canadian National.

Panel Discussion on Train Handling. Charging Freight Trains in Cold Weather Conditions—Donald E. Whitney, assistant general air brake supervisor, Great Northern.

### *Tuesday—September 22*

**9 am**

Joint Meeting with CDOA:

Light Repair Track and Train Yard Operation, including initial and intermediate terminal air brake tests.

26 Locomotive Brake Equipment, Its Characteristics of Operation and Maintenance—Central Air Brake Club.

Planned Research for Railroad Braking—W. B. Kirk, chief engineer, Westinghouse Air Brake Company.

Factory Modernized AB Brake Equipment—Glenn Thompson, sales engineer, New York Air Brake Company.

L. A. Stanton
Pres., A.B.A.

W. C. Bowra
Speaker

### *Wednesday—September 23*

**8:30 am**

Joint meeting with LMOA:

Maintenance of Air Compressors and Appurtenances.

Elections.

Budd Disc Brake for Passenger and Freight Cars—R. G. Stacy, manager disc brake sales, Railway Division, Budd Co.

Emergency Repairs to Air Brake Equipment on the Road—St. Louis Air Brake Club.

Latest Techniques in Lapping Air Brake Components—E. F. Katzke, Crane Packing Company.

**Allied Exhibits**
*. . . pages 78 and 79*

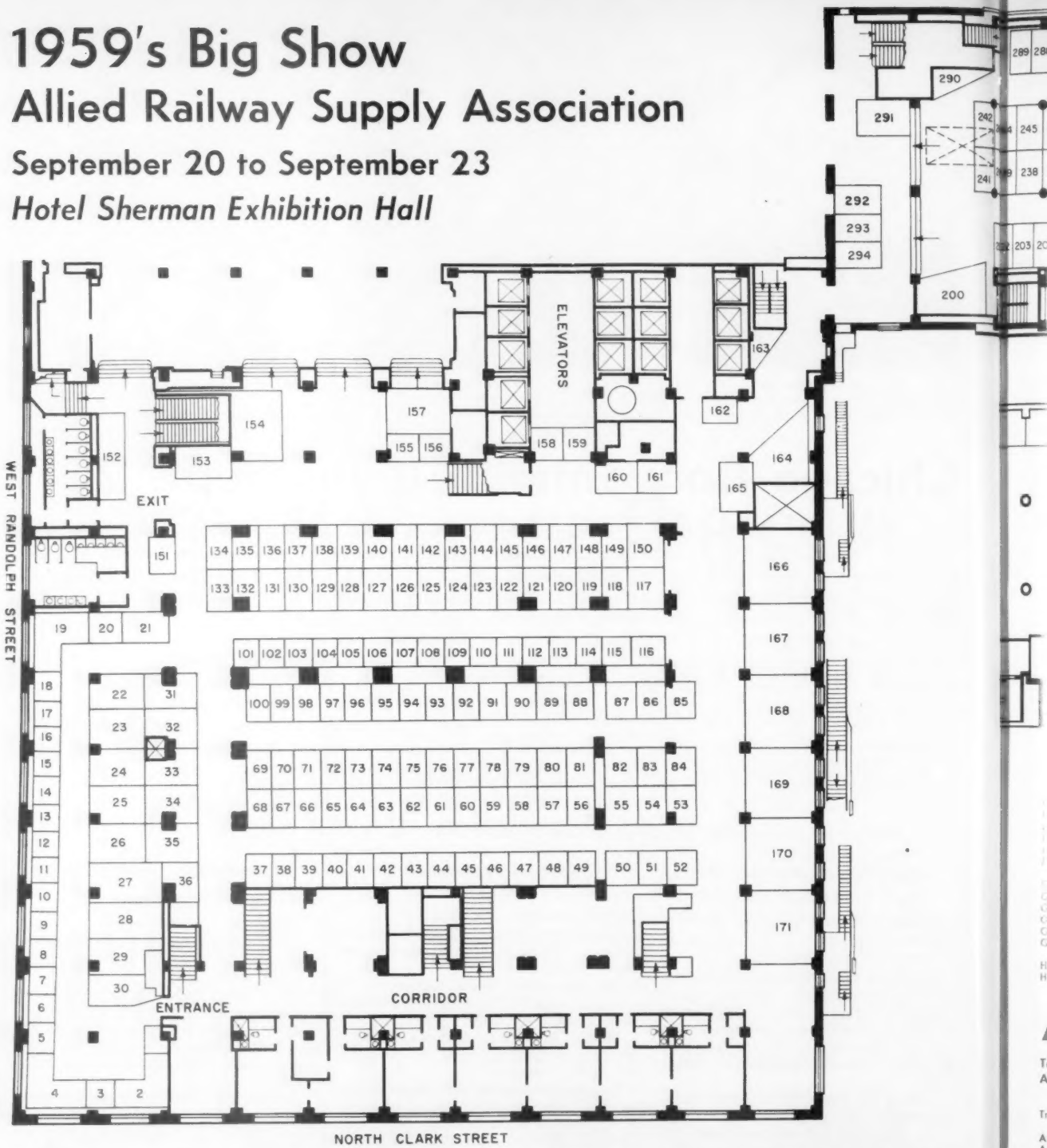
**Coordinated Programs**
*CDOA, LMOA, RF&OOA*
*. . . page 80*

# 1959's Big Show

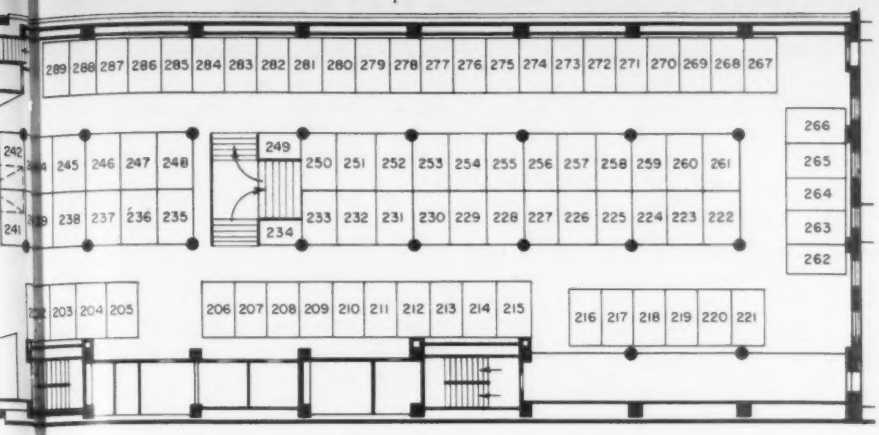
## Allied Railway Supply Association

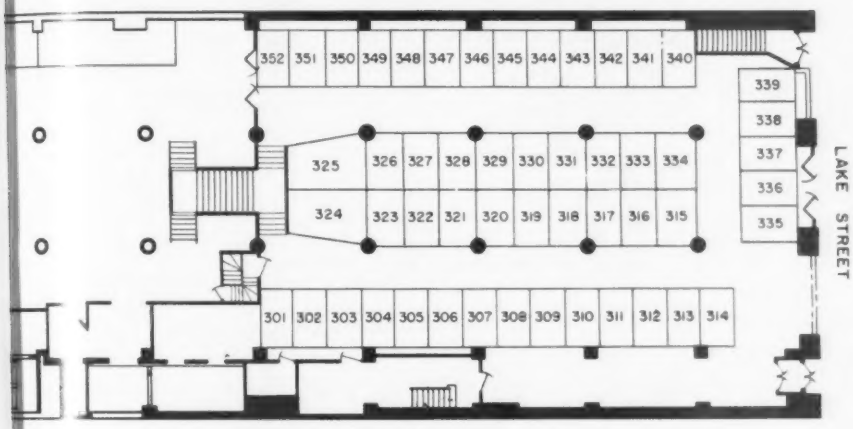
### September 20 to September 23

*Hotel Sherman Exhibition Hall*




| EXHIBITORS | BOOTH NO. |
|---|---|
| Aeroquip Corp. | 301 to 304 |
| Air-Maze Corp. | 79 to 81 |
| Ajax-Consolidated Co. | 206 to 208 |
| Alco Products, Inc. | 312 to 314 |
| Allison Div., General Motors Corp. | 154 |
| American Brake Shoe Co. | 37 to 41 |
| American SAB Co. | 168 |
| American Steel Foundries | 230 to 234 and 249 to 253 |
| Arcair Co. | 351-352 |
| Archer-Daniels-Midland Co. | 214-215 |
| Barco Mfg. Co. | 144-145 |
| Beck & Blatchford, Inc. | 33-34 |
| Bendix Aviation Corp. | 69 |
| Buckeye Iron & Brass Works | 111 |
| Buckeye Steel Castings Co. | 226-227 and 256-257 |
| Budd Co. | 209 to 213 |
| Buffalo Brake Beam Co. | 240 to 243 and 290 |
| Burrell Flange Lubricator Co. | 78 |
| Callaway Mills, Inc. | 56-57 |
| Cardwell-Westinghouse Co. | 167 |
| Chicago Malleable Castings Co. | 156 |
| Chicago Pneumatic Tool Co. | 228-229 and 254-255 |
| Chicago Railway Equipment Co. | 101 to 103 |
| Chromium Corp. of America | 158-159 |
| Cleveland Graphite Bronze Co. | 6-7 |
| Cleveland Hone & Mfg. Co. | 68 |
| Coffing Hoist Div., Duff-Norton Co. | 114 to 116 |
| Component Engine Parts, Inc. | 97 |
| Continental Coatings Co. | 305-306 |
| Curtiss-Wright Corp., Princeton Div. | 58 to 60 |
| Davis Brake Beam Co. | 90 to 92 |
| Dearborn Chemical Co. | 270-271 |
| Deems Equipment & Supply Co. | 23 |
| Diesel Injection Sales & Service, Inc. | 348 |
| D O Co. | 31 |
| Double Seal Ring Co. | 225 and 258 |
| Doweloc, Inc., Div. of D. B. Frampton Co. | 331-333 |
| Duff-Norton Co. | 114 to 116 |
| Electric Storage Battery Co. | 75 to 77 |
| Electro-Motive Div., General Motors Corp. | 262 to 266 |
| Ellcon-National, Inc. | 45 to 47 |
| Enterprise Railway Equipment Co. | 108 to 110 |
| Equipment Research Co. | 149 |
| Fairbanks, Morse & Co. | 327-328 |



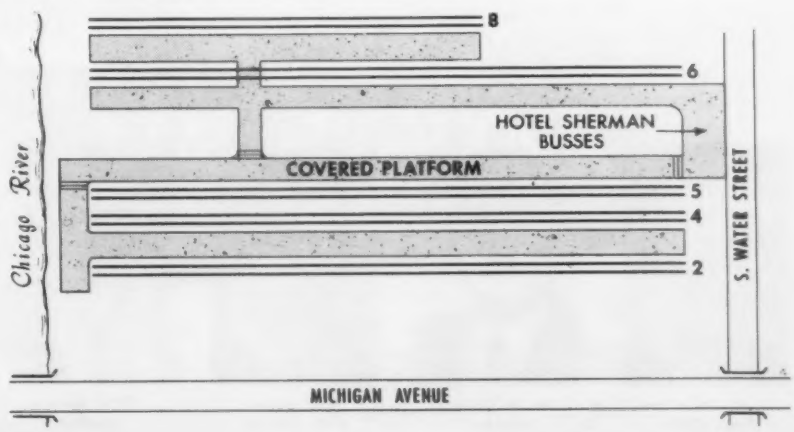

LOWER EXHIBIT HALL

| | |
|---|---|
| [illegible] Co. | 318 to 320 |
| [illegible]rrell Manufacturing Co. | 335 to 339 |
| [illegible]ne Organics, Inc. | 350 |
| [illegible]ost Paint & Oil Corp. | 155 |
| [illegible]ost Railway Supply Co. | 107 |
| [illegible]allo Corp. | 22 |
| General Steel Castings Corp. | 160-161 |
| Gould-National Batteries, Inc. | 82 to 84 |
| [illegible]ray Co. | 323-324 |
| Griffin Wheel Co. | 281 to 284 |
| Gulf Oil Corp. | 315-316 |
| Gustin-Bacon Mfg. Co. | 272 to 274 |
| Hall-Toledo, Inc. | 61-62 |
| Hanlon & Wilson Co. | 104 to 106 |
| Hennessy Lubricator Co. | 278 |
| Holland Co. | 132 to 135 |
| Houston Co. | 53 |
| Hunt-Spiller Mfg. Corp. | 224 and 259 |
| Johns-Manville | 325-326 |
| Journal Box Servicing Corp. | 124 to 126 |
| Joyce-Cridland Co. | 288-289 |
| Kaiser Aluminum & Chemical Corp. | 321-322 |
| K. W. Battery Co. | 112-113 |
| Kelty Radiator Co. | 307-308 |
| Keystone Railway Equipment Co. | 12-14 |
| LFM Mfg. Co., subsidiary of Rockwell Mfg. Co. | 8 to 11 |
| M & J Diesel Locomotive Filter Corp. | 118-119 |
| MacLean-Fogg Lock Nut Co. | 141 to 143 |
| Magnus Metal Corp | 98 to 100 |
| Miller Lubricator Co. | 153 |
| W. H. Miner, Inc. | 19 to 21 |
| Mink-Dayton, Inc. | 244 |
| Minnesota Mining & Manufacturing Co. | 15-16 |
| Modern Railroads | 152 |
| Morton Manufacturing Co. | 42 to 44 |
| Motor Coils Manufacturing Co. | 93-94 |
| Nalco Chemical Co. | 222-223 and 260-261 |
| National Carbon Co., Div. of Union Carbide Corp. | 275 to 277 |
| National Malleable & Steel Castings Co. | 117, 150, 162, 164 and 165 |
| New York Air Brake Co. | 285 to 287 |
| Oakite Products, Inc. | 17-18 |
| Owatonna Tool Co. | 333-334 |
| Pacific Car & Foundry Co. | 120 |
| Peerless Equipment Div. of Poor & Co. | 146 to 148 |
| Pocket List of Railroad Officials | 123 |
| Precision Engineering Co. | 29 |
| Prime Manufacturing Co. | 48-49 |
| Pullman-Standard Div., Pullman, Inc. | 163 |
| Punch-Lok Co. | 346-347 |
| Pyle-National Co. | 267 to 269 |
| Railway Locomotives and Cars | 151 |
| Railway Service & Supply Co. | 122 |
| Republic Steel Corp., Berger Div. | 95-96 |
| Reynolds Metals Co. | 340 to 345 |
| Rust-Oleum Corp. | 216 |
| SKF Industries, Inc. | 292 to 294 |
| Scullin Steel Co. | 291 |
| Security Railway Products Co. | 63-64 |
| Shell Oil Co. | 35-36 |
| Simmons-Boardman Publishing Corp. | 151 |
| Sloan Valve Co. | 88-89 |
| Sperry Rail Service | 309 to 311 |
| Spring Packing Corp. | 27-28 |
| Standard Car Truck Co. | 3 to 5 |
| Superior Hand Brake Co. | 85 |
| Thrall Car Mfg. Co. | 86 |
| Timken Roller Bearing Co. | 127 to 131 and 136 to 140 |
| Turco Products, Inc. | 30 |
| T-Z Railway Equipment Co. | 24-25 |
| Union Asbestos & Rubber Co. | 279-280 |
| Union Spring & Mfg. Co. | 157 |
| Uni-Pak Corp. | 73-74 |
| United Specialties Co. | 329-330 |
| Unit Truck Corp. | 240 to 243 and 290 |
| United States Rubber Co. | 65 to 67 |
| Universal Railway Devices Co. | 166 |
| Vapor Heating Corp. | 201 to 205 |
| Waugh Equipment Co. | 26 |
| Welch, M. I., & Son | 239 |
| Western Railroad Supply Co. | 1-2 |
| Westinghouse Air Brake Co., Air Brake Div. | 217 to 221 |
| Whitehead & Kales Co. | 171 |
| Wine Railway Appliance Co. | 235 to 238 and 245 to 248 |
| Wyandotte Chemicals Corp. | 50 to 52 |
| Yale & Towne Mfg. Co. | 169 |
| Youngstown Steel Car Corp. | 170 |
| Youngstown Steel Door Co. | 200 |

# ARSA Track Exhibit — *South Water Street*

**Track exhibit area is located east of Michigan Avenue and north of the ICRR Suburban Station.**

| Track Exhibits | Track No. |
|---|---|
| Aluminum Co. of Canada, Ltd. | 8 |
| American Car & Foundry Div. of ACF Industries, Inc. | 4 |
| American Steel Foundries | 2 |
| Buffalo Brake Beam Co. | 6 |
| Evans Products Co. | 5 |
| Ford Carliner Division | 5 |
| General American Transportation Corp. | 4 and 6 |
| General Steel Castings Corp. | 8 |
| MacLean-Fogg Lock Nut Co. | 2 |
| Midland Resin | 2 |
| Pacific Car & Fdry. Co. | 5 |
| Pullman-Standard Div., Pullman, Inc. | 6 |
| Standard Car Truck Co. | 2 |
| Standard Railway Equipment Mfg. Co. | 5 |
| Stran-Steel Corp. | 5 |
| Thrall Car Mfg. Co. | 2 |
| Union Asbestos & Rubber Co. | 5 |
| Union Tank Car Co. | 2 |
| Unit Truck Corp. | 5 |
| United States Rubber Co. | 2 |
| Westinghouse Air Brake Co., Air Brake Div. | 2 |



# Car Department Officers' Assn. – *Louis XVI Room*

### *Monday—September 21*

**10 am**

Address by president.

Report of Committee on Design, Maintenance and Upgrading Freight Car Equipment.

Address—F. Peronto, executive vice-chairman Mechanical Division, AAR.

**2 pm**

Panel Discussion—Problems involving Trailer-on-Flat-Car Loading—H. L. Hewing, superintendent of interchange, Chicago Car Interchange Bureau.

Report of Committee on Interchange and Billing for Car Repairs.

Report of Committee on Loading Rules.

### *Tuesday—September 22*

**9 am**

Report of Committee on Light Repair Tracks and Train Yard Operation, including initial and intermediate terminal air-brake tests. (In joint session with Air Brake Association.)

Report of Committee on Car Lubrication.

Comments—W. M. Keller, vice-president (research), AAR.

### *Wednesday—September 23*

**9 am**

Report of Committee on Wheels, Axles and Wheel Shop Practices.

Report of Committee on Passenger Car Maintenance:

1. Air Conditioning and Heating.
2. Cleaning and refurbishing.
3. Repairs.

Report of Committee on Maintenance and Servicing Mechanically Equipped Refrigerator Cars.

Report of Committee on Painting.

Miscellaneous reports.

Election of officers.

# Locomotive Maintenance Officers' Assn. – *Grand Ballroom*

### *Monday—September 21*

**10 am**

President's address.

Diesel Electrical Maintenance—Topic: Traction Motor Problems.

**2 pm**

Diesel Material Reconditioning and Control—

Topic 1: Cylinder head reclamation.

Topic 2: Lube oil cooler and radiator reclamation.

Fuel and Lube Oil—

Topic: Selection, handling and policing economy fuels; their effect on locomotive maintenance and operation.

### *Tuesday—September 22*

**8:30 am**

Steam Generator and Water Treatment—

Topic: Steam generator operation and maintenance.

Shop Equipment—

Topic 1: Advances in wheel shop equipment and practices.

Topic 2: Equipment for economical fuel injection testing and repair.

### *Wednesday—September 23*

**8:30 am**

Diesel Mechanical—Other (In joint session with Air Brake Association)—

Topic 1: Maintenance of air compressors and appurtenances.

Topic 2: Exhaust manifold maintenance.

Address—E. K. Bloss, director research and development, Boston & Maine.

Diesel Engine Maintenance—

Topic: Power assemblies—maintenance and developments.

New Developments in Motive Power Maintenance—Topic: New ways to improve maintenance and reduce costs.

# Ry. Fuel & Operating Officers' Assn. – *Bel Tabarin*

### *Monday—September 21*

**10 am**

Address by president and report of secretary.

Address—O. H. Zimmerman, vice-president, Illinois Central.

Safety film: "Are You Slipping"—Southern.

Promoting Public Relations—C. E. Taylor, manager public relations, Chesapeake Region, Pennsylvania.

Film: "The Big Train"—pertaining to railroad legislation. Remarks by Douglass Campbell, vice-president, New York Central System.

**2 pm**

Joint meeting with Air Brake Association:

Address—W. C. Bowra, general manager, Central Region Canadian National.

Panel Discussion on Train Handling.

### *Tuesday—September 22*

**9 am**

Panel Discussion on Freight Loss and Damage.

Panel Discussion on Benefits Derived from Radio Communication.

Address—L. W. Menk, vice-president and general manager, St. Louis-San Francisco.

Abuse of Diesel Locomotive Flat Spots—R. A. Wieand, assistant road foreman, Pennsylvania.

Chemical Treatment of Rails To Increase Adhesion.

### *Wednesday—September 23*

**9 am**

Panel Discussion on Conservation Practices that Affect the Utilization of Fuel.

Panel Discussion on Diesel Failures—Causes and Remedies.

**2 pm**

Official business.

Open discussion of subjects presented from the floor.

# Coordinated Mechanical Associations
## *Luncheon*
## *Tuesday, September 22, 12:30 p.m.*

K. H. Carpenter
Pres., CDOA

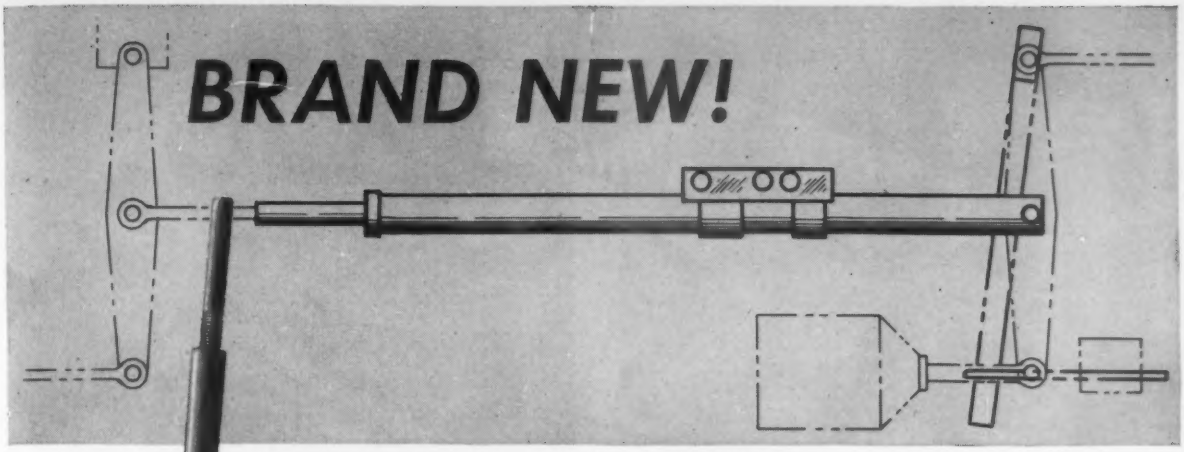
W. M. Keller
Speaker

E. V. Myers
Pres., LMOA

E. K. Bloss
Speaker

C. R. Patterson
Pres., RF&OOA

L. W. Menk
Speaker

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## MODEL 1340

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- Shoe wear or replacement is compensated instantly.
- Shoes can be replaced without touching the regulator.
- Tested to operate at 100 psi on 12" cylinder.
- Will not slip under impact.
- All steel construction.
- No need for a man to go under the car.
- Does not cycle.

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**OF:**

**ELLCON-NATIONAL INC.**

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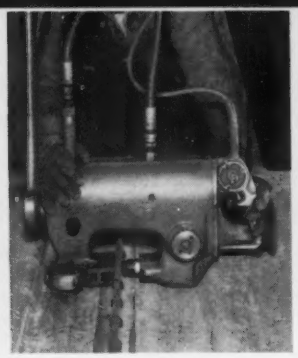
**CP Speed Recorders** give the engineer instant, accurate reading of train running speed, and provide a permanent record of locomotive performance on tape.

**CP 612-RLP Impact Wrench** makes crab nut removal fast and easy, even in close quarters.



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**CP 3440-TS Impact Wrench** makes triple valve maintenance a production line job. Saves 75% of time in running off nuts.

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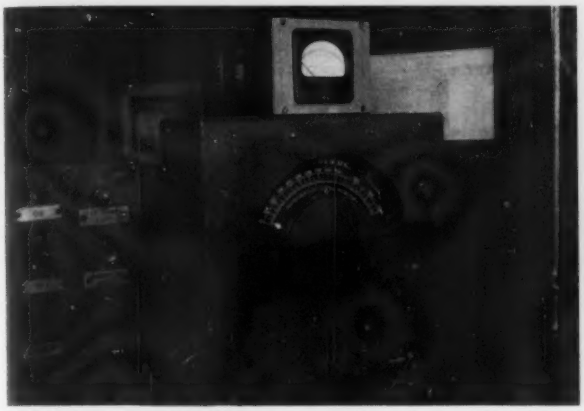
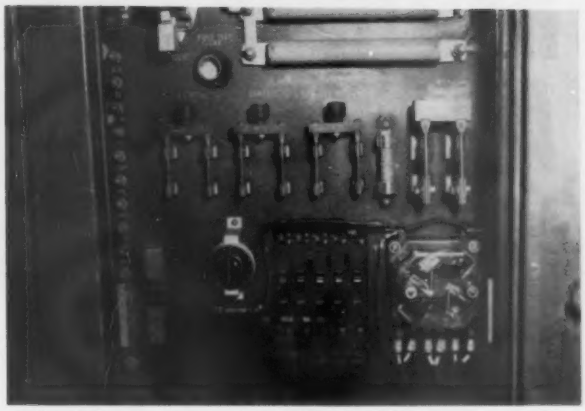


Milliameter with special dial to show condition of locomotive's insulation is mounted on top of regular load meter.



Mechanical timer in electrical control cabinet limits operation of diesel with ground relay cut out to 15-min period.

# C&NW Crews See Grounds Developing

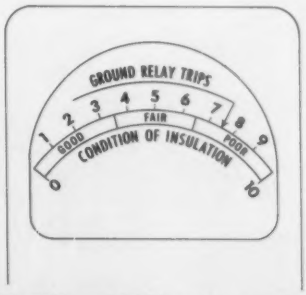
## *Device on suburban locomotives shows condition of electrical insulation in high voltage system*

A SYSTEM that enables enginemen to see when a ground is developing on a diesel-electric locomotive has been satisfactorily tested on the Chicago & North Western. Additional equipment has been ordered for 65 suburban locomotives.

The device consists of a direct current milliameter mounted in a metal box and located above the locomotive loadmeter in plain view of the engineer. The instrument has a specially designed dial calibrated from 0 to 10. The quadrant between 0 and 3½ is colored green, between 3½ and 6½ amber, and between 6½ and 10 red. Below the quadrant are the words "Condition of Insulation." The milliameter is connected in series with the ground relay operating coil so that the flow of current straying from the high voltage system is clearly indicated at all times. An arrow at the 7½ figure on the dial indicates the exact point at which the ground relay will trip. The ground relay is modified to work in conjunction with the milliameter so that it will re-set automatically. The re-set button has been removed.

None of the protection afforded by the ground relay has been eliminated because the ground relay will still trip when the current flow reaches the intensity at which the relay is designed to trip. If the ground is momentary, the relay will reset immediately. If the ground is constant, the relay will be held out.

Ground relay action which results from moisture, usually occurs in the 8th throttle notch where the highest generator voltage is reached. It is not uncommon for the ground relay to trip when the steam generator is blown down, due to steam penetrating inside the traction motors. The engineer will observe a reading on the milliameter depending on the condition of the insulation. If the hand should move up to 7½, the ground relay will trip.




GOOD, FAIR, and POOR zones on milliameter are colored green, yellow and red, respectively.

Notching back to the 7th throttle position reduces the generator voltage and the current flow to ground will be reduced. If reduced enough, the ground relay will re-set and operation can be continued in the 7th notch.

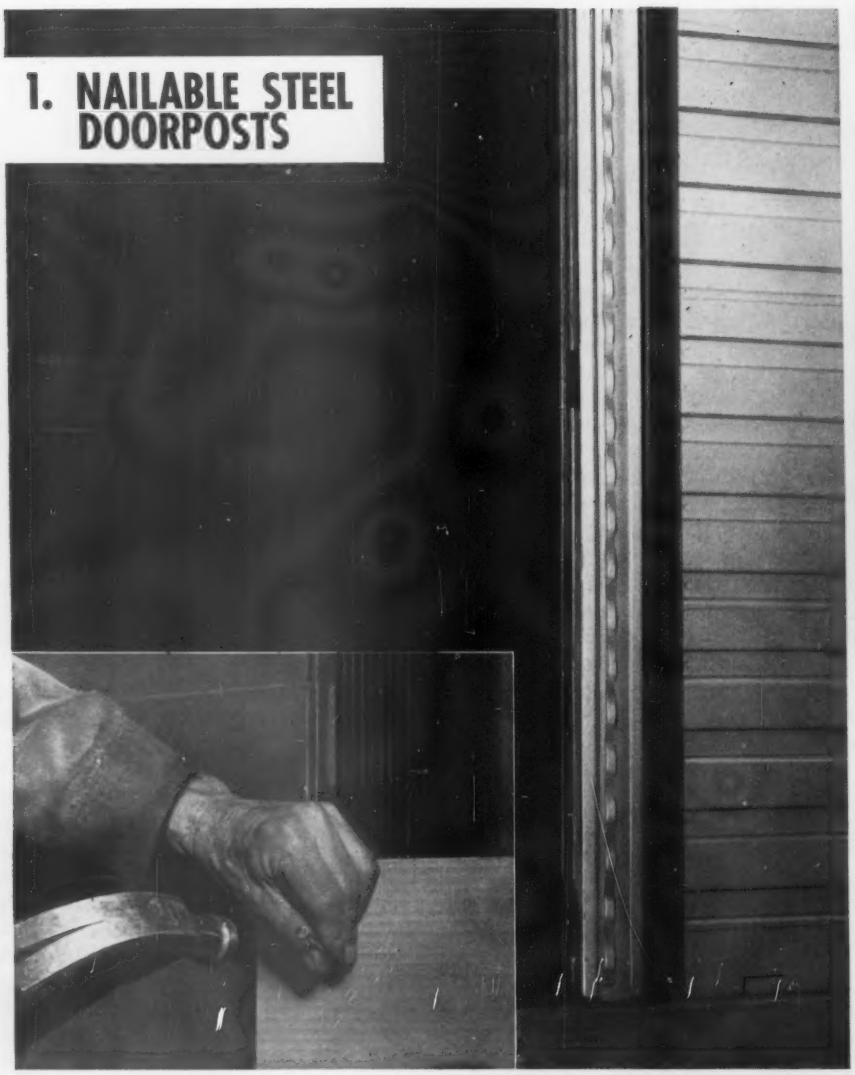
By observing the reading on the dial, the engineer will know when the traction motors have dried enough to resume operating in the 8th notch. If the ground is severe, the 4th or 5th throttle position may have to be used. In such density of traffic encountered in suburban service (40,000 passengers in and out of Chicago each day, 65 trains during a three hour period in the morning and 62 in the evening), this operation is much better than tying up the mainline with a complete engine failure.

The engineer will always know how severe the ground is. Since the milliameter is connected in series with the ground relay, it is protected by interlocks which open when the ground relay trips. Thus, no fuse is necessary to protect against solid metallic grounds that sometimes occur. With grounds on the 64-volt system, the ground relay is apt to trip while cranking the diesel engine as at this time, the high and

*(Continued on page 86)*

# 3 STRAN-STEEL RAILROAD PRODUCTS SAFEGUARD ALL VITAL AREAS, LENGTHEN BOXCAR LIFE

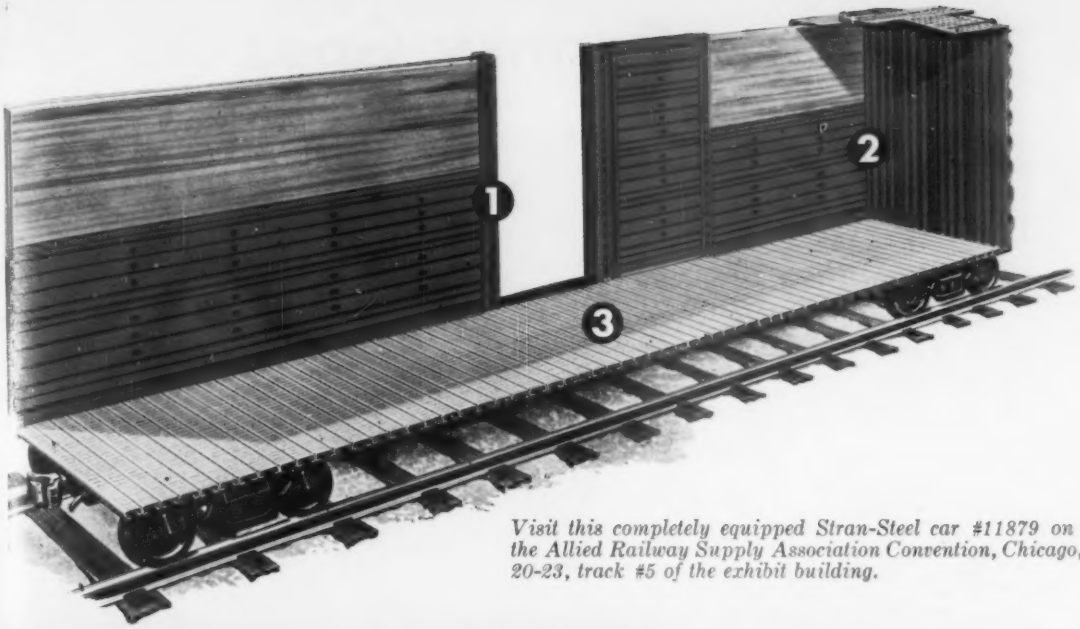
## 1. NAILABLE STEEL DOORPOSTS



## 2. ANCHOR LINER

**Stran-Steel Anchor Liner** helps protect sidewalls and endwalls against the damage which commonly causes 70% of rip-tracking. Recessed strap anchors make bracing of lading quick, easy and safe.

**Nailable Steel Doorposts** with steel grooves take repeated nailing of grain doors without weakening or splintering (see inset photo), strengthen vulnerable doorways, protect against lading and lift truck damage, and stand up for years of Class A service. Nailable Steel Doorposts can be used with either sliding or plug doors.




*Visit this completely equipped Stran-Steel car #11879 on display at the Allied Railway Supply Association Convention, Chicago, September 20-23, track #5 of the exhibit building.*

Side heights are variable; endwalls full length. GLX-W high-strength steel reduces dead weight compared to ordinary carbon steel liners of equal strength.

**Nailable Steel Flooring** solves floor repair problems, adds structural strength to the underframe, and helps move more freight with fewer cars. N-S-F cars carry all types of lading—rough, sacked, finished or bulk and stay in revenue service longer. Unique nailing grooves insure secure blocking, floors remain damage-free.

*Seventy leading railroads now have more than 72,000 N-S-F freight cars in service. If you would like detailed information and cost studies, contact your nearest Stran-Steel representative. Offices in Chicago, New York, Philadelphia, St. Louis, Cleveland, San Francisco, Minneapolis and Atlanta. In Canada, Stran-Steel railroad products are made and sold by International Equipment Co., Ltd., Montreal.*

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**STRAN-STEEL CORPORATION**

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION

*(Continued from page 83)*

low voltage systems are tied together.

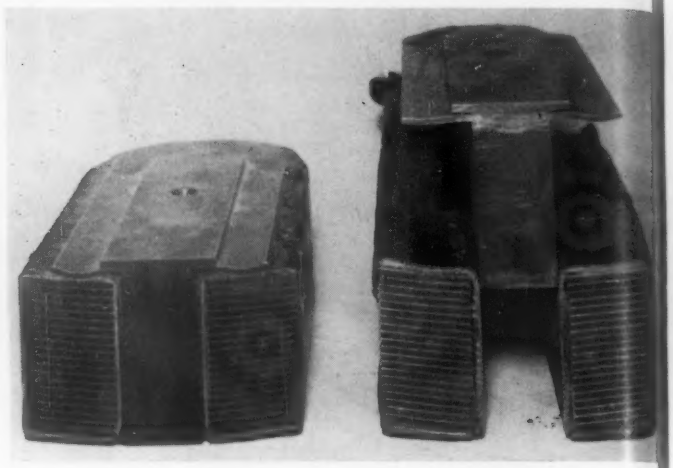
With the present arrangement, the ground relay will reset itself as soon as the starter button is released. Under normal operating conditions and in dry weather, the hand will remain on 0 quadrant reading. Work reports will be required from the engineer to indicate the highest point reached by the hand. Should it reach figures between 3½ and 6, the report will provide information to shopmen to look for weak insulation in the high voltage system.

While the C&NW mechanical department does not approve of pulling the knife switch cutting out the ground relay, there are times when it has been ordered in suburban service to clear the mainline. An additional device has been installed to operate in conjunction with the milliameter and the automatically resetting ground relay. It consists of a 15-min mechanical timer with electrical contacts which close when the knob is completely turned to the right, setting the timer for its full operation. A suitable resistor for desensitizing the ground relay 100 per cent is also installed.

These two items in series are connected in parallel to the ground relay. In extreme cases of ground relay action, which sometimes previously required pulling the knife switch, the engine crew now turns the time switch which permits the locomotive to operate normally until the time switch runs down. This automatically cuts out the de-sensitizing resistor. If after turning the time switch, the locomotive still trips the ground relay, there would be no use of pulling the knife switch as the ground relay action is no doubt caused by a solid, metallic ground. Further operation of the locomotive might lead to permanent damage to the rotating equipment. The time switch with resistor provides a certain amount of protection which is not the case when the knife switch is pulled.

Some thought was given to removal of the knife switch. It was left in so that the electricians would have a suitable means for isolating the high voltage system from ground before making megger tests. The knife switches are being sealed with instructions to engine crew not to break seal and open switch. The C&NW expects to learn much about the effect of humidity on the insulation of the high voltage system through application of this device.

# Pennsy Goes All Out



A four-year program of research and development has resulted in the Pennsylvania's adoption of epoxy resin insulations for traction motors and generators. Along with the new insulation system, PRR engineers have perfected a number of other improvements in motors and in techniques for repairing them.

Already it is estimated that the "integrated insulation system" is saving the road $500,000 annually, and that these savings can reach $1,500,000 when all 2710 diesel and electric units are equipped. The insulation has been found so effective that a standard EMD traction motor has been operated in a tank of water with armature and field coils completely submerged.

PRR engineers do not take credit for discovering epoxy resins, or for originating the principle of resin impregnated coils. But it has been through their efforts that epoxy impregnation has now been applied to large railway motors and generators.

It all started over four years ago when examination of records of PRR diesel locomotives for the previous six years showed the traction motor to be a high-failure component. Changes made had, until then, effected little improvement in performance. Unlike many roads, the PRR came to the diesel locomotive with a background in electric traction. The road's engineers realized that diesel d-c motors should not have the high failure rates that were then being experienced.

Manufacturers had been concentrating on the use of insulating materials with greater temperature resistance to prevent damage to motors through high-temperature operation. The basis of the new Pennsy program was the development of methods for getting the heat out of the motors so it could not cause damage. In the case of insulating materials, this is not easy. Most electrical insulations are also thermal insulators.

It was then that PRR engineers became aware of the unique heat-transfer properties of epoxy resins which, when properly cured, make a virtually void-less solid with no microscopic bubbles to trap heat. They interested Motors Coils Manufacturing Company of Pittsburgh in experimenting with various epoxy formulations (RL&C, June 1959, p 66), while the PRR men worked on applications of the resins for solution of their motor problems.

The goal was development of a dielectric which would conduct heat. Well over two years ago, the first epoxy impregnated field coils went into service on PRR locomotives. They ran a little hotter than desirable, but proved to be so durable and resistant to service conditions that Pennsy men knew they were on the right track.

Field coils had received initial attention in this program because they were the components most frequently responsible for motor failures. Typically they have been impregnated with phenolic varnishes. Separations and

---

This is the first of two articles on the Pennsylvania's program to improve performance and cut maintenance costs of locomotive motors and generators.

# for Epoxies

Integrated insulation on this EMD traction motor makes possible operation with only the commutator and the brushes above water.

Epoxy impregnation of field coil (left) bonds coil and pole piece into unit which can include heat-conducting copper spacer. Open-face coil is at right.

voids frequently occur, varnishes age quite rapidly, and coils are subject to contamination failures.

The PRR and Motor Coils worked with a series of impregnating materials. Some synthetics are unstable and accelerated aging and heat distortion tests were conducted to assure that materials would have economical service lives. To give complete impregnation, resin viscosity must be low during the process. In the case of phenolic varnishes this is accomplished by mixing with a vaporable solvent which is driven off during the curing process. It is during the evolution of this solvent that some voids develop in the resin. Vapor pressure of the solvent also prevents use of extremely high vacuum and allows air to remain in the insulated structure when varnish is admitted and when the impregnated structure is finally cured.

The epoxy which the Pennsylvania is now using requires no solvent and retains its low initial viscosity during the impregnation process. Because there is no solvent, it is possible to use very high vacuum and assure thorough impregnation without trapping air in the finished structure.

### Integrated Insulation

The finished product is called, by PRR engineers, an "integrated insulation system." Large mica splittings are used both in tape and wrappers to provide the dielectric strength. The mica is bonded to its glass tape backing with an epoxy completely compatible with the epoxy used for impregnation. All components augment each other in the final structure, both from mechanical and dielectric standpoints.

Because of the improved dielectric properties and thorough impregnation possible with the new system, it has been possible to provide ten per cent more copper in both field and armature coils. This yields less heat during operation and provides better heat-flow paths. In the case of the trouble-some field coils, the PRR has been able to install a copper shim between the pole piece and the coil. This spacer extends out over the top of the coil where it contacts the motor frame, and serves to conduct heat out of the unitized coil assembly.

Since the first epoxy-impregnated field coils went into service in 1956, there have been no failures. There have been cases of motor overheating so severe that the heavy steel motor frame was distorted and coil leads burned, but the coils themselves proved to be so rugged they could be reused.

Progress in field coil insulation is shown by results of tests of the series of impregnating materials with which the PRR worked during its development program. Traction motors were equipped with field coils molded to the pole pieces and treated with various synthetic resins. Motor operating temperatures (deg C) and time required to reach this stabilized temperature (hrs) under full load conditions are shown below:

| | Final temp., deg C | Stabilizing period, hr. |
|---|---|---|
| Open-face Coil | 137 | 3.5 |
| Conventional Insulation | 275 | 4.5 |
| Polyester No. 1 | 268 | 5.0 |
| Polyester No. 2 | 248 | 2.5 |
| Sillicone Rubber | 224 | 5.0 |
| Epoxy No. 1 | 207 | 3.5 |
| Epoxy No. 2 | 160 | 5.0 |
| Epoxy No. 3 | 141 | 5.0 |

Open-faced coils could not be used because of contamination failures. The PRR rejected each of the synthetics until Epoxy No. 2 was put in service in 1956. In April 1959, Epoxy No. 3 became standard. It operates only 3 per cent warmer than the open-faced coil (141 vs 137 deg C), and Epoxy No. 3 is the first of the PRR-tested resins to operate below its heat distortion temperature (150 deg C).

In addition to better heat dissipation, possible with the new coil, the ability to bond more and more motor components together with epoxy further reduces the danger from contaminants, cuts down on vibration damage, and insures even greater service life for parts. Already 900 traction motors and 68 diesel main generators have been put into service and it is expected that they may last 5 to 10 years longer than those with original insulations. The PRR has found it necessary to overhaul motors with conventional insulation after three years of service and many failed before that. Early last month, one PRR spokesman predicted that there should be virtually no need for the traditional mileage overhaul for motor armatures and frames, when they are insulated with the integrated system or its equivalent.

Several major motor manufacturers are currently working to develop resins equivalent to those now used by the PRR. The series of design improvements and new repair techniques, developed by the Pennsy and now being made available to the electrical industry and other railroads, will be discussed next month.

## These five pennies, during a 12-year period, more than covered all parts replacement costs on an average

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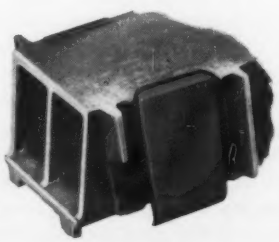
This represents an average replacement cost of only $.0985 per carset—*less than 5 cents per National C-1 Truck in service!*

A-298A

*wedges*
*.00131% replacement*

*wedge springs*
*.0019% replacement*



*wear plates*
*.00064% replacement*

***See the National C-1 Truck with over 370,000 miles "reefer" service in 8 years.***
***On display at the ARSA Show Hotel Sherman, Chicago, September 20-23.***

# C-1 TRUCK

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# EMD Electro-Magnetic Switch Gear

## *Part 1*

THE NEED FOR CONTROL AIR in the electrical control cabinet was eliminated from the GP-9 locomotives on January 1, 1958. Considerable work had to be done prior to this change to assure compatible locomotive response from drastically different control devices. Prior to 1958, the force to move large electrical contacts was provided by air cylinders. Now this is done by electro-magnetic devices. Here we will examine the specific functions and differences in accomplishing them.

First to consider is how the direction selection of traction motor rotation is accomplished. Because the series motor is universally used for diesel-electric locomotives, reversing is done by reversing the direction of current through the series field with respect to the armature. Fig. 1 shows a circuit from the positive terminal through the field from F to FF. The armature can be connected so that it will turn clockwise when the power circuit is energized. To reverse rotation, the operating coil is energized which will close the contacts shown open, and open those shown closed. Energizing the power circuit with the coil energized would then produce counter-clockwise armature rotation.

### Basic Differences

The initial difference between magnetically and pneumatically operated switch gear shows up here. All contacts are connected mechanically to a common drive with pneumatic devices. This drive consists of an air piston driving a rack which engages a gear mounted on a square shaft. A ball detent restrains the pistons in their previously used position, or in neutral (which must be selected manually). None of the contacts makes an electrical circuit to the motor fields. The basic magnetically operated device has only two natural positions with a manually selected (not basic) provision for a fully open electrical circuit. With magnetically operated reversers, there is one device for each motor circuit. Motor circuit as used here means one or more motors permanently connected in series.

There are four reversing contactors in the GP-9, one for each motor. One

*(Continued on page 92)*

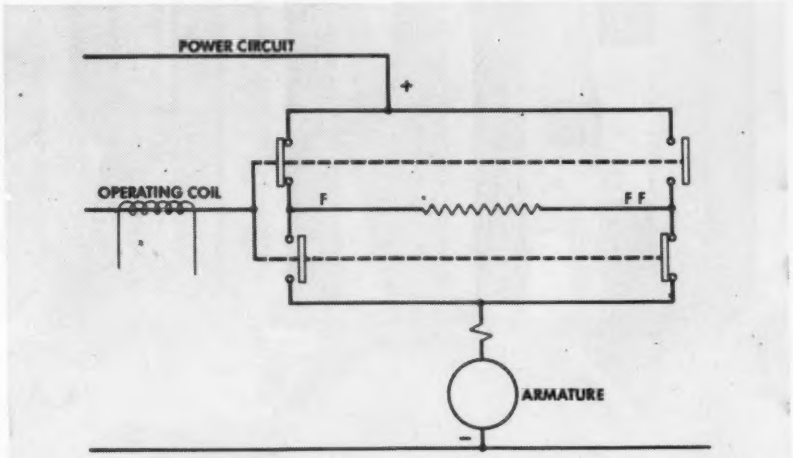



**Fig. 1—Basic circuit for reversal of traction motors is illustrated. Arrangement replaces original drum-type reverser previously standard.**

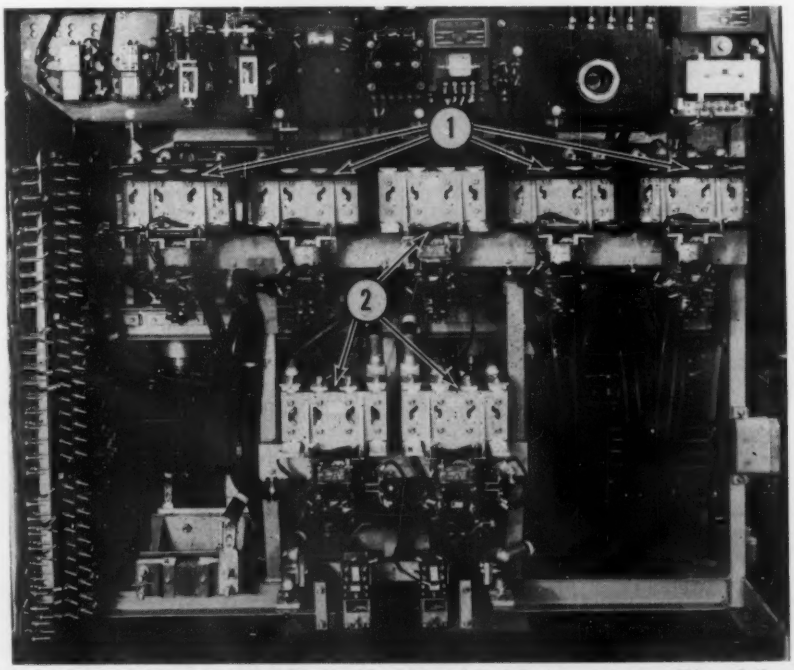
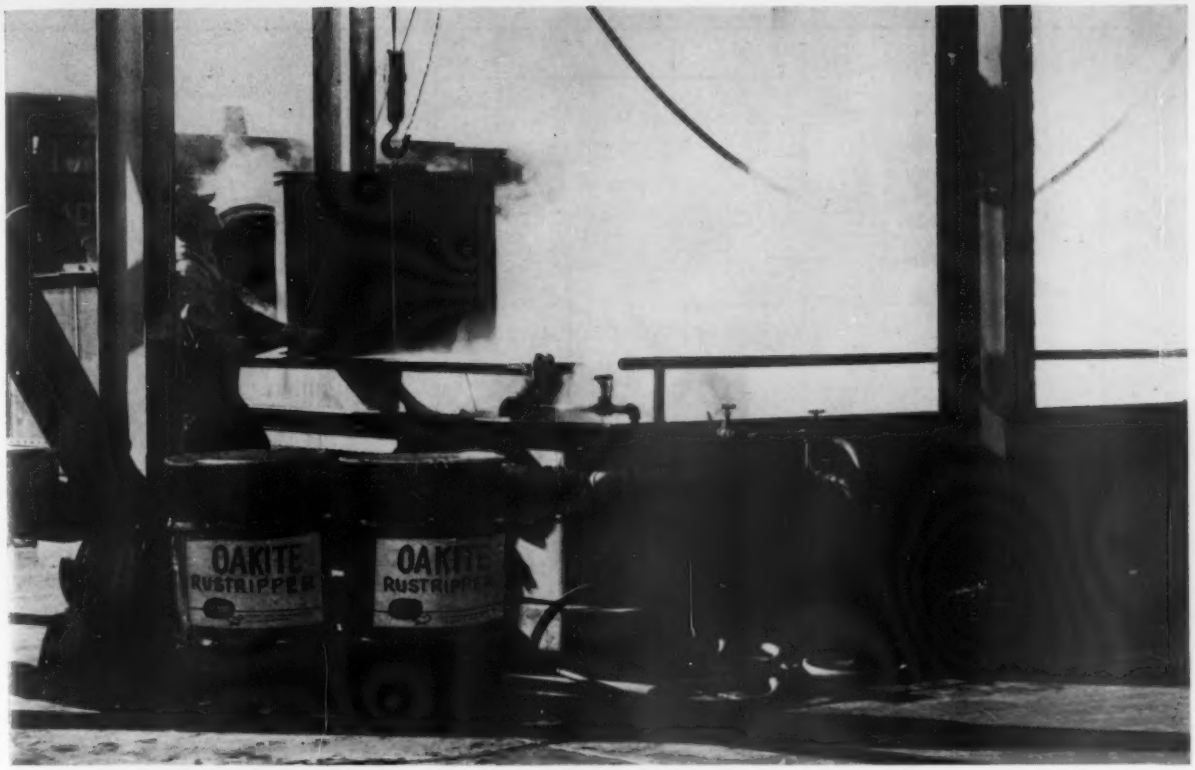



**Fig. 2—Control cabinet of GP-9 locomotive contains four reversing contactors (1) and three dynamic braking contactors (2) on the cab side. Power contactors are on engine side.**

This is the first of two articles on the operation of electro-magnetic switch gear. It was prepared by the Electro-Motive Division. The first installment of this series on GM locomotive electrical equipment appeared in April 1959, p 67.

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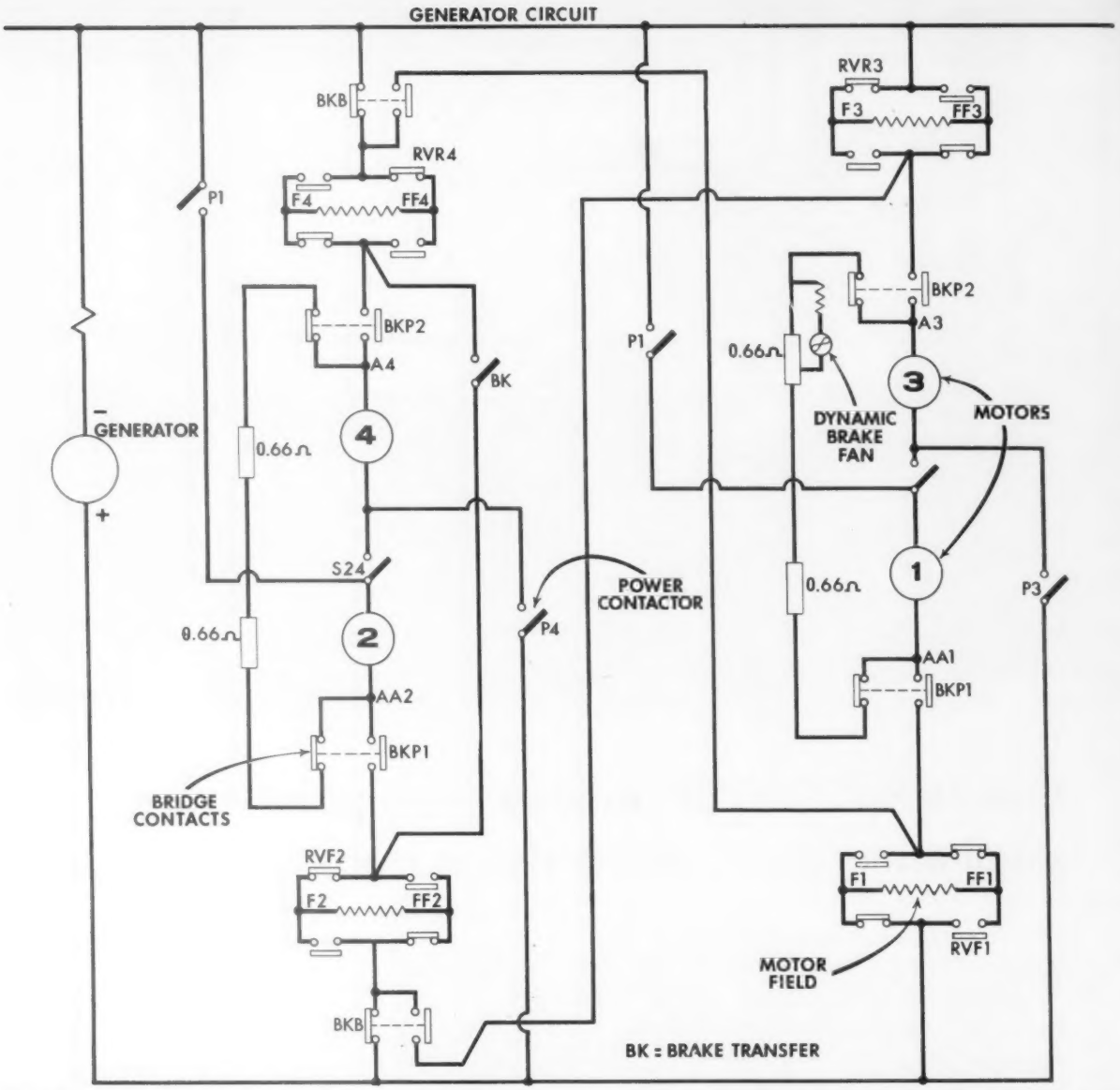



Fig. 3—Power circuits for this typical road switcher unit with electro-magnetic switch gear include dynamic brake loops. Basic functioning of braking contactors and reversing switches is similar with this arrangement.

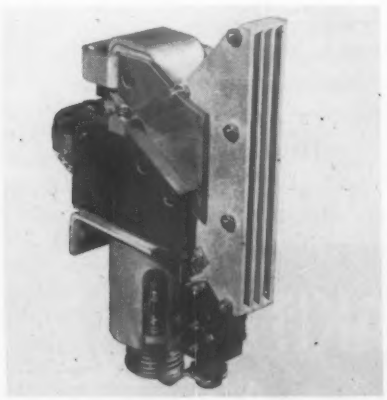
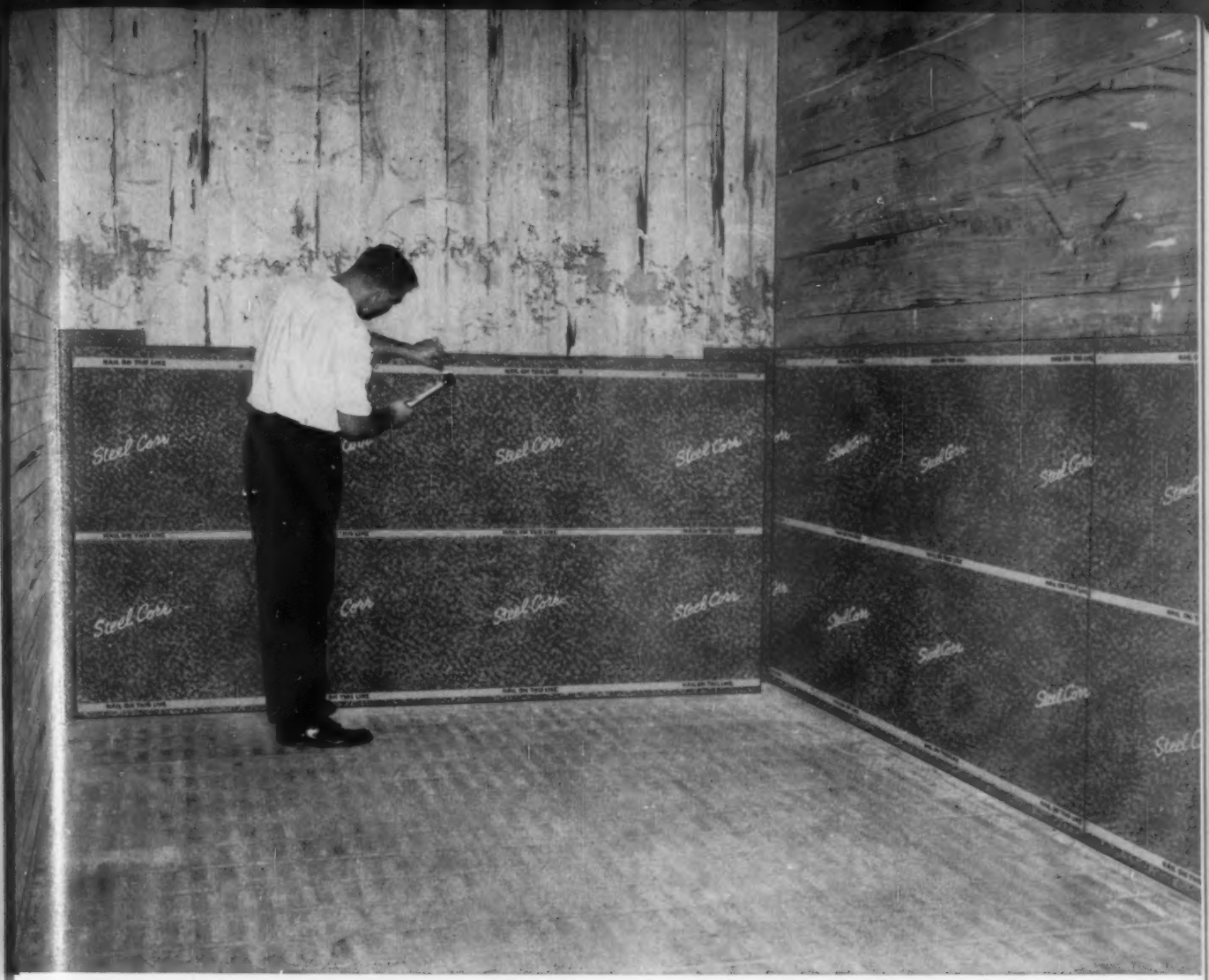


Fig. 4—Power contactor design has enclosed interlocks on front of the device. Special coil and magnet frame were key developments.

direction of motion is established by energizing two of the devices RVF1 and RVF2, and the other direction by energizing RVR3 and RVR4. The reversing contactors must remain energized continuously to maintain the power circuit through the normally open contacts. This is shown in Figure 3. Many readers will no doubt recognize that a hazard exists in depending upon a continuously energized contactor coil to insure proper motor connection. A coil failure could produce very severe damage if there were no provision for protecting the system. Protection is, to a large extent, a natural characteristic of the magnetic power contactor design.

The basic power circuits and dynamic braking are shown by Fig. 3. In case of total auxiliary power failure, or pulling of the main control switch, all curcuits are incomplete. This arrangement eliminates hazards when towing the unit dead. One other interesting aspect indicated by this diagram is that only BKB of all the two-pole double-throw devices has appreciable voltage between the transfer sections. These devices are designed to operate at the highest voltage encountered in the transmission system between transfer section, however the high voltage circuits are kept separated as far as conveniently possible. *(To be continued)*

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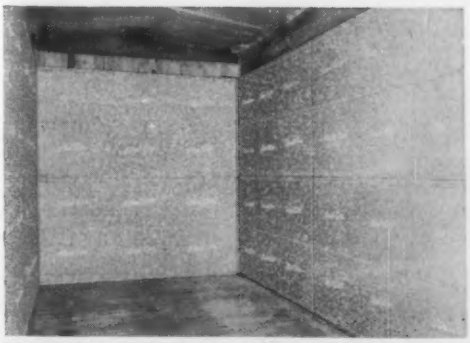

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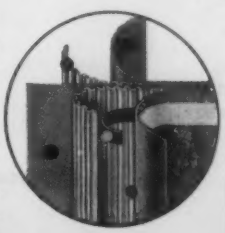

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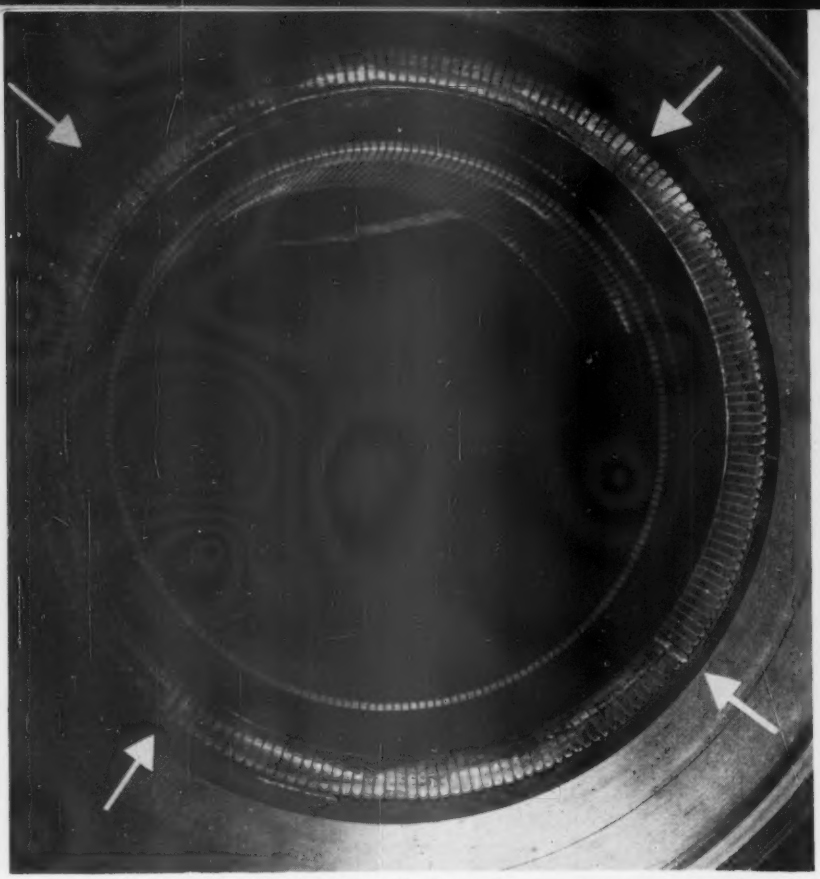
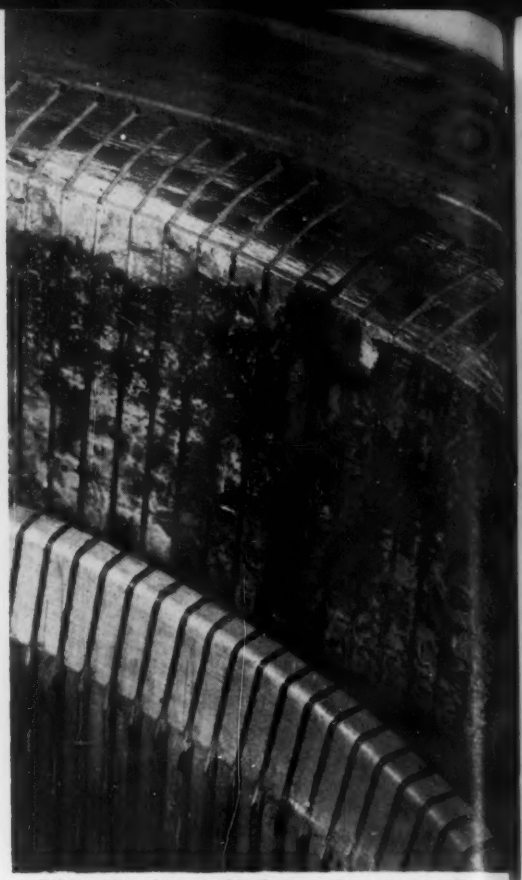


Four swollen bars at 90-deg to each other on this commutator were apparently caused by standstill heating. Inspections can reveal potential trouble sources.



Enlarged bar shows in this close-up of one section of the complete commutator at the left.

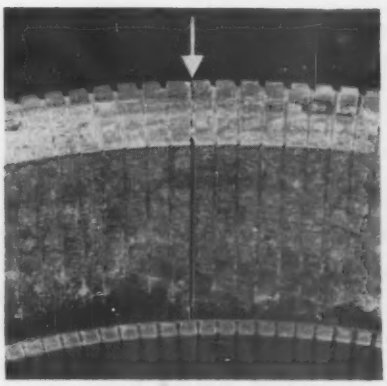
*Inspection During Motor Rewinds . . .*

# Insures Commutator Performance

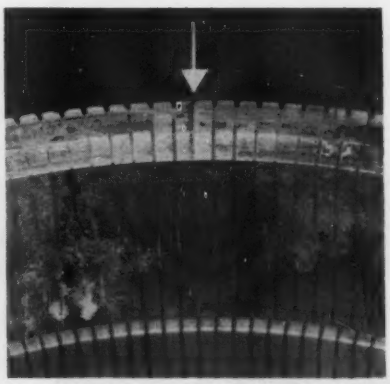
Opening the commutators of all traction-motor armatures which have failed and have been sent in for repairs is now being done by the National Electric Coil Division of McGraw Edison. The condition of the commutator may only require replacement of the mica V-rings, but experience indicates that potential trouble is averted in many cases.

Future trouble is made evident in the form of swollen bars, slipped segment mica, distorted sections of bars, and carbon tracking. When such evidence is explored by disassembling the bars and segment mica, it is often apparent that the mica has moved with relation to the copper, leaving no mica between the inner edges of the bars. In some cases, it also may be seen that the bars have been sprung and the outer edges are no longer straight. Commutator repair may consist of replacing only a few bars and mica segments, but, if many are required, a complete refill may be the most economical solution.

Attention is also given to the steel spider and steel rings. If necessary, these are machined on the 3-deg and 30-deg surfaces. In machining steel and copper surfaces, all commutators are made arch bound by further machining the copper 3-deg bore. All repaired jobs are assembled, processed, and seasoned before being given the same voltage tests applied to a new commutator. Commutator surfaces are turned and ground.

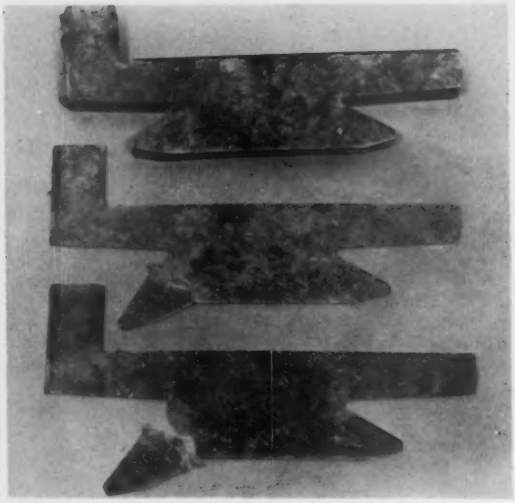


Mica in this slot has slipped outward, but undercutting has covered evidence on the surface.

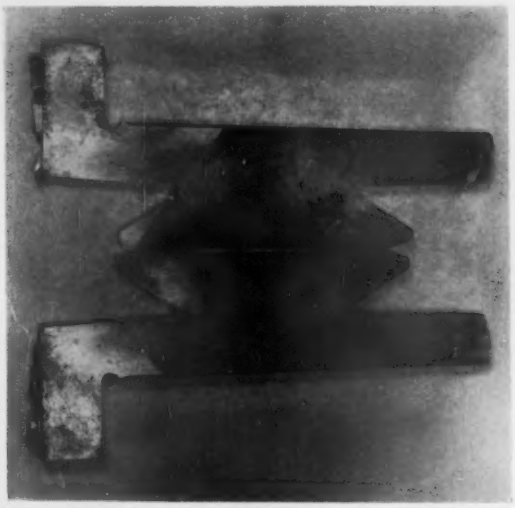


Complete lack of mica between two bars of this commutator could not be detected at surface.

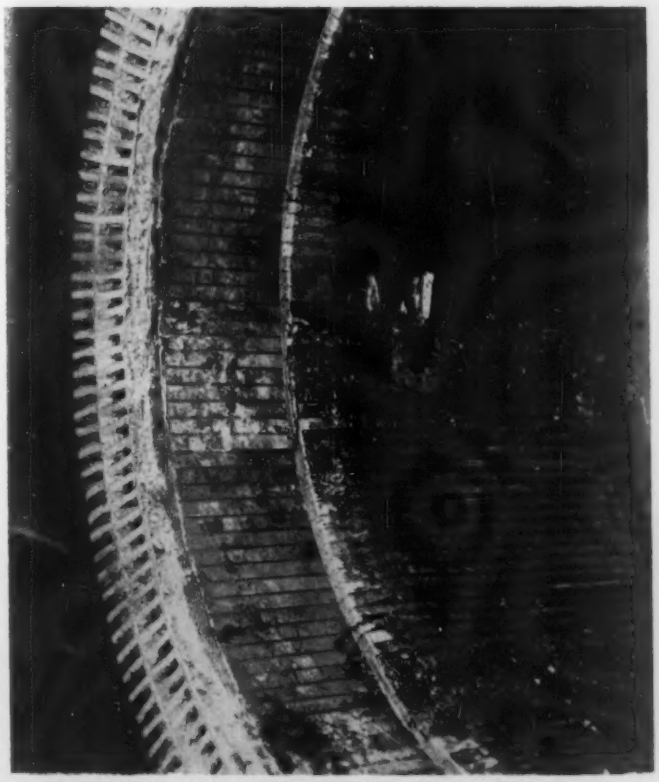
Loose mica on the surface of this commutator is immediately evident, but only complete disassembly can show faults existing inside.



Slot mica was found to be broken when this commutator was opened for complete inspection.



Bars removed from a commutator show contact surfaces no longer flat; V-ring grooves distorted.



Corroded and charred inner commutator surfaces, disclosed by disassembly, are potential sources of eventual motor trouble.

Black lines on mica V-ring show shorting between inner bar surfaces giving this carbon tracking.

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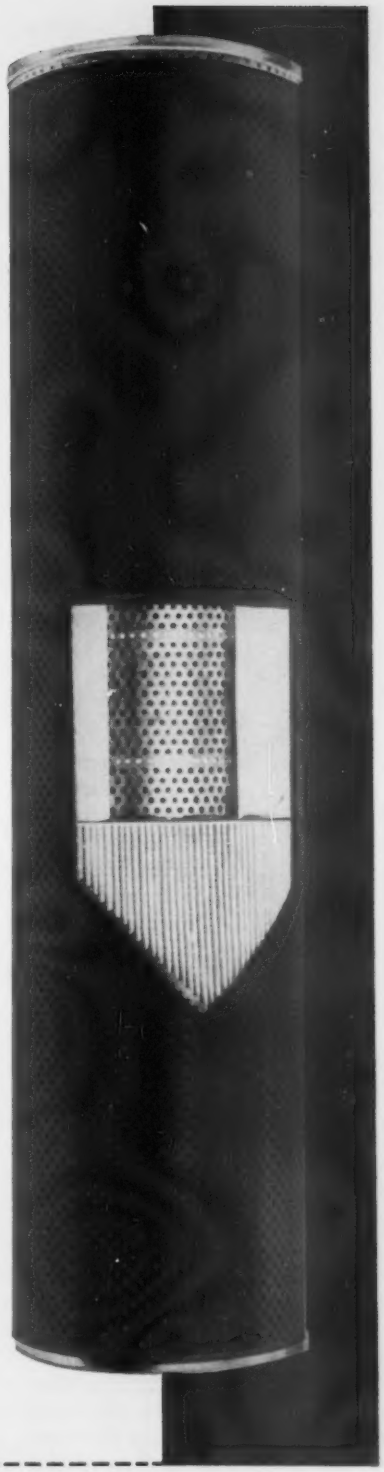

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6. Rinse Basket in clean water or with steam hose
7. Dry Basket
8. Install New Cartridge in cleaned Basket
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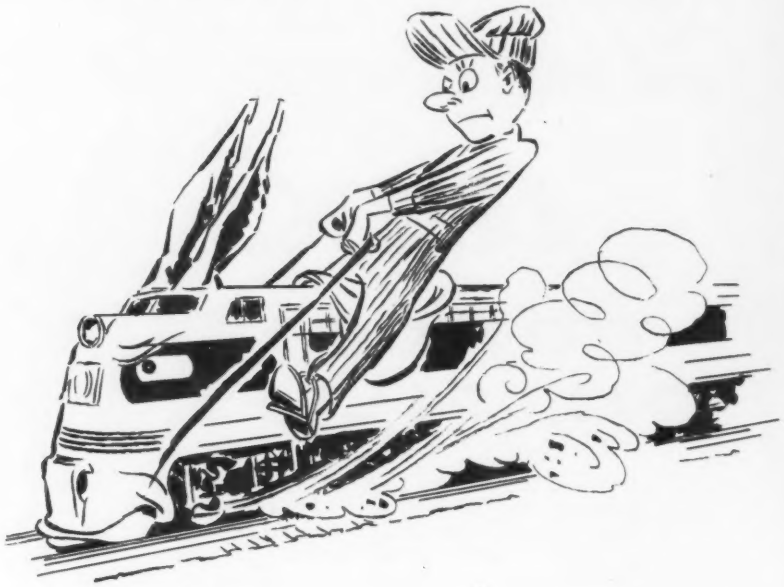
# *Stopping a Stubborn Diesel*



**By Gordon Taylor**

This case is one of the strangest listed in my note book. There have been many cases where diesel units would drop load, or refuse to load up; but these engines refused to drop load until they were completely shut down. The cause is not too difficult to understand, but it proved to be a real puzzle for Engineer Roy Runner and Fireman Sam Smith who were operating the locomotive at the time.

What happened? A two-unit EMD passenger locomotive, Model E7, was leaving Union Station at the start of its trip. At a suburban station stop, the engineer noticed that the locomotive persisted in its effort to move the train after he had put the throttle in idle position and set the brakes. He called to the station agent to phone the diesel house so the foreman could meet the train in the shop yard a few miles ahead. When the train reached the yard, Engineer Runner again moved the throttle to "idle" position and set the brakes. The locomotive acted the same as it had at the suburban station. Engineer Runner then said: "I will open the 'control' push-button switch and the generator field switch; that should make it give up." But, strange to say, the engines continued their effort to move the locomotive and train. The engineer then pressed the Emergency Stop Button on the throttle lever and pushed the throttle to Stop position. This action shut down all engines on both units and, for the first time, brought the locomotive under complete control.

By this time, Bill Barlow, the electrical foreman, responding to the phone call, had boarded the locomotive. "This is the first time," Runner told him, "that I ever had to completely stop all the engines to make a locomotive stop pulling.

"You opened nearly every switch on this lead unit," Barlow agreed, "but the steam generator is still running and taking current from the battery. We don't need the steam generator just now, so let's open its control switch. With it shut down, we'll start the engines on this lead unit and see if we can locate our trouble."

When the steam generator switch was opened, the generator field contactors and power contactors, which had never opened, now dropped out. After the engines were started and placed on the line, the trouble had disappeared. "The only thing different on the locomotive is that the control switch on the steam generator has been opened," Barlow pointed out. "So, we will put the steam generator back in service and see what happens."

When the steam generator was started, the trouble in the locomotive control system reappeared. The power contactors and generator field contactors would not drop out, and the unit persisted in its effort to move the train.

"Well," said Barlow, "this proves that there is some ground on the steam generator that provides a circuit to by-pass the generator field switch. Just now, the important thing is to get this train moving. We can do it by cutting out the steam generator on the lead unit; the one on the trail unit will keep the train comfortable. Start the engines on that rear unit and get going. When these units get back in here tomorrow, I will check the control system and correct the trouble."

The locomotive resumed its trip without trouble. When the locomotive returned to diesel house the next day, Barlow made a test of the wiring on steam generator of the lead unit. He found that the circuit was grounded on the fuel valve solenoid. This cleared up when he replaced the solenoid. But his trouble-shooting job was not complete until he found how this could by-pass the power transmission control system. Trouble was still riding that locomotive and it must be found.

Barlow then traced a schematic wiring diagram to refresh his memory on the circuits that energized the generator field contactors and power contactors. He found that the circuit that energizes the generator field contactor

(*continued on page 102*)

This series of articles is based on actual experiences of men who operate and maintain diesel-electric locomotives.

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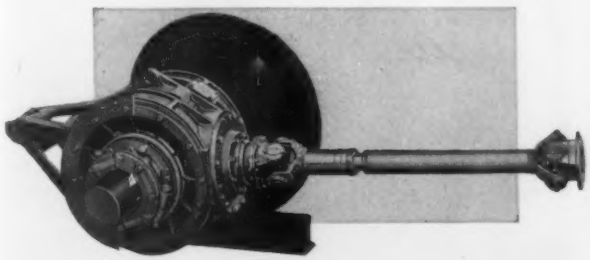

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*Many of these products manufactured in Canada by Hayes Steel Products Limited, Merritton, Ontario.*

*(Continued from page 98)*

and battery field contactor starts where the positive side of battery connects with control knife switch. Closing this switch feeds current to a 30-amp fuse which connects with the "Control" push-button switch at the engineer's control station. This control switch, when closed, energizes wire "PC" in the trunk control cable. A tap wire from "PC" connects with throttle control drum. When the throttle drum is moved to No. 1 position, it energizes "EX" wire which connects with one side of Generator Field push-button switch. When the "GF" switch is closed, it energizes "GF" wire in the control trunk cable.

A wire tap from GF wire passes control current to a finger of the isolation switch which, in running position, passes current to the shunt field and battery field contactors, bringing them to a closed position. It is thus seen that closing the GF switch will energize the field contactors, if the throttle drum is in No. 1 or higher positions. Opening the GF switch will, under normal conditions, open the field contactors.

There is also a tap from the GF trunk wire which connects to the reverser switch and passes current to the "FOR" wire, or "REV" wire, depending on the position of the reverser switch. This has the effect of passing control current to energize the series and parallel power contactors and holds the power contactor closed as long as control current energizes them.

The question facing Barlow was how the Generator Field and Control push-button switches could become helpless in controlling the locomotive. It was seen at once that, if one end of a jumper wire was connected to the positive side of the battery circuit and the other end connected to the GF trunk wire in the control cable, the GF control switch and Control push-button switch could be by-passed and rendered useless. Since there was no such jumper wire, it became clear that two grounded wires were providing the jumper circuit. One such ground, discovered at the steam generator solenoid, provided the positive battery connection. Another ground in the GF trunk wire on the load side of GF switch would shunt control current around the GF switch and keep the contactors from dropping out even though engine was operating at idle speed.

The next step was to locate the ground in the GF wire. Further checking located that trouble. The GF wire was found grounded where the insulation had been chafed in a conduit fitting. This was quickly corrected. The grounded GF wire in the lead unit, along with the grounded positive battery wire, left the GF wire energized at all times the steam generator circuits were energized. It also resulted in the GF wire being energized on the trailing unit, as well as on the lead unit, so that control of both units of the locomotive was affected.

This is a good example of what grounded control circuits can do on a diesel-electric locomotive. One ground may not give trouble, but you are on the way to trouble if another ground occurs at the right place. Usually, such trouble occurs when positive and negative grounds created a short circuit. But this case shows that two grounds on the positive side of a circuit can be harmful if they shunt out, or bypass, an important control switch. If a locomotive unit has one ground in the control circuit, it already has two strikes against it. It is a good idea to clear up that ground before your unit strikes out.


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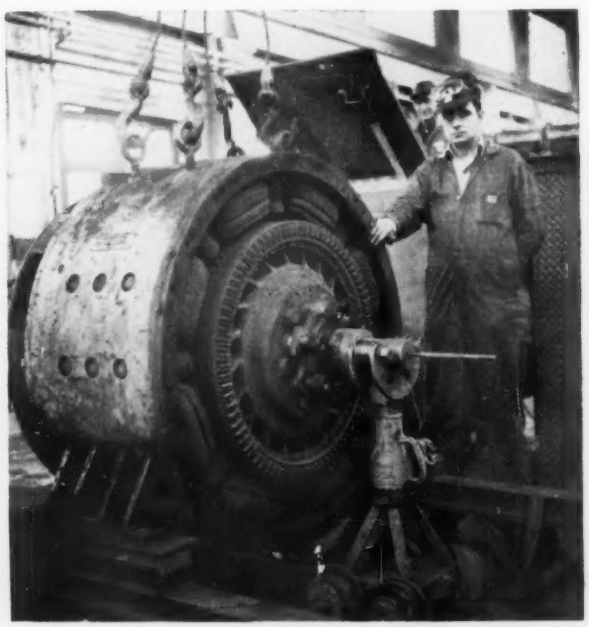
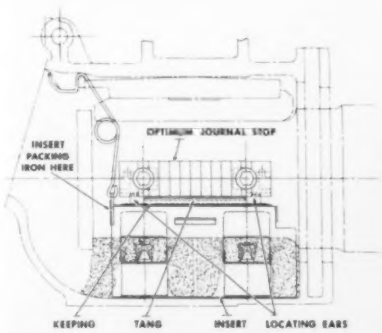


**Missouri Pacific uses this device to remove armatures from generators at its North Little Rock, Ark., shop. Two parallel rails between I-beams supporting the generator are equipped with two four-wheel dollies, each having a specially mounted hand-operated screw-type Buda jack. To remove the armature, a 6-ft extension is bolted to the shaft end opposite the commutator, and the end frame and bearing removed. The dollies are placed under end of shaft and extension, weight taken by the jacks, and armature rolled out. Blocks under bolting pads of generator can be varied in height to suit different generator sizes.**

(*Continued from page 37*)

for mixing with the oxygen stream. A vibrator insures steady delivery of the powder to the screw. A hand wheel controls the feed rate.

The Flame Ceramic lightweight coating torch is designed for lightness and ease of handling. It is equipped to burn hydrogen and oxygen at the proper rate to heat the Flame Ceramic powders. The torch may be used in any position because the feed is not dependent upon gravity. It can be used for mechanical and free-hand coating. *Continental Coatings Corporation, Dept. RLC, 17706 Miles ave., Cleveland 28.*



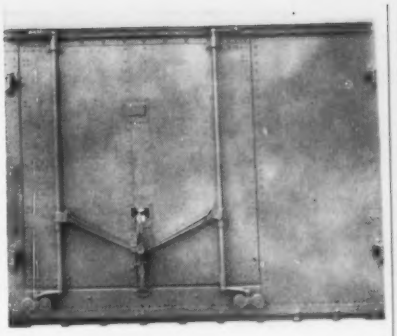

## Journal Lubricator and Journal Stop

An insert type lock replaces the welded lock for securing the Optimum lubricator in the journal box. The insert lock slips easily into the box and is secured by the locking spring engaging the wedge lug in the front of the box. It has the same functional characteristics as the welded lock. There is one size lubricator for all size boxes, two lubricators per box.

The Optimum journal stop is readily applied to any integral side frame or pedestal type box without retainer ribs. It is installed after application of removable lock insert and comes equipped with 1/16-in. shim, which produces the desired total clearance of 3/16-in. between journal and stop face when journal is full size (G-1) and inside box width is nominal. When journals are G-3 or G-5, a second or third shim is applied to each stop. *Railway Service & Supply Corp., Dept. RLC, 510 S. Harding st., Indianapolis 7, Ind.*

## Refrigerator Car Door

Five positive lock bolts are used in a sliding refrigerator freight car door to give additional protection from bulge loads. The bolts are actuated through the screw shaft operating mechanism. Four lock bolts, two in each vertical edge, are so located as to resist load pressures from the inside of car, when impacted in switching. These bolts, the bar connecting them, and the operating cams are concealed within the reinforcement



on the inside of the door panel. The fifth lock bolt, at the bottom horizontal center of the door, operates on the outside and minimizes the possibility of bulge distortion at the center of the door. *Youngstown Steel Door Co., Dept. RLC, 332 S. Michigan ave., Chicago.*

## Automatic Fueling System

The automatic refueling system, H-1020, is designed specifically for railroad service. It consists of a nozzle containing the actuating and shut-off mechanism; a coupler valve for the locomotive which provides a path for flow to the pilot valve and includes a check valve which prevents fuel loss from the tank; the pilot valve, mounted on the fuel tank, which is the fuel level sensing element, and an accessory kit consisting of ¾-in. tubing and fittings. This equipment differs from the manufacturer's original design RL&C, April 1959, p 46) installed on all Boston & Maine locomotives and RDC cars.

The new design has the shut-off mechanism in the fueling station nozzles instead of on the locomotives, which reduces first costs. It is now possible to stop fuel flow manually any time during the fueling operation, and the nozzles can be used to fill units not equipped with the Houston system. Design of the shut-off provides a time delay, preventing pressure surges and protecting hoses from bursting. The locomotive coupler valve incorporates a filter screen of the type basic to most locomotives.

Fuel flow is automatically stopped when the tank is full, preventing overflow. The single design will handle flows from 60 gpm at 1 psi up to 400 gpm at 20 psi. *Houston Company, Dept. RLC, Wallingford, Conn.*

(*Turn to page 106*)


X-4
GEARED HEAD WRENCH
MORE POWER • LESS EFFORT

The X-4 is NOT a ratchet wrench but a HEAVY-DUTY GEARED TOOL

**POWERFUL!** — Geared head construction generates high torque (4 to 1 ratio) with a fraction of effort. Designed compactly for maximum strength . . . minimum weight.

**EFFICIENT!** — Eliminates the need for extra man-power. One man can use it — anywhere. Unequaled where space is limited.

**SAFE!** — Allows workman to perform his duties without excessive strain or fatigue. Hazards of impact or sledge type wrenches are eliminated.

**VERSATILE!** — Light — compact. All standard torque wrenches can be used with the X-4. Available in 3 sizes. Torque capacities up to 4000 foot pounds.

*For complete information see your local distributor or write direct to:*

X4

The
X-4 CORPORATION
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**NEW Column wear plate with high weldability**

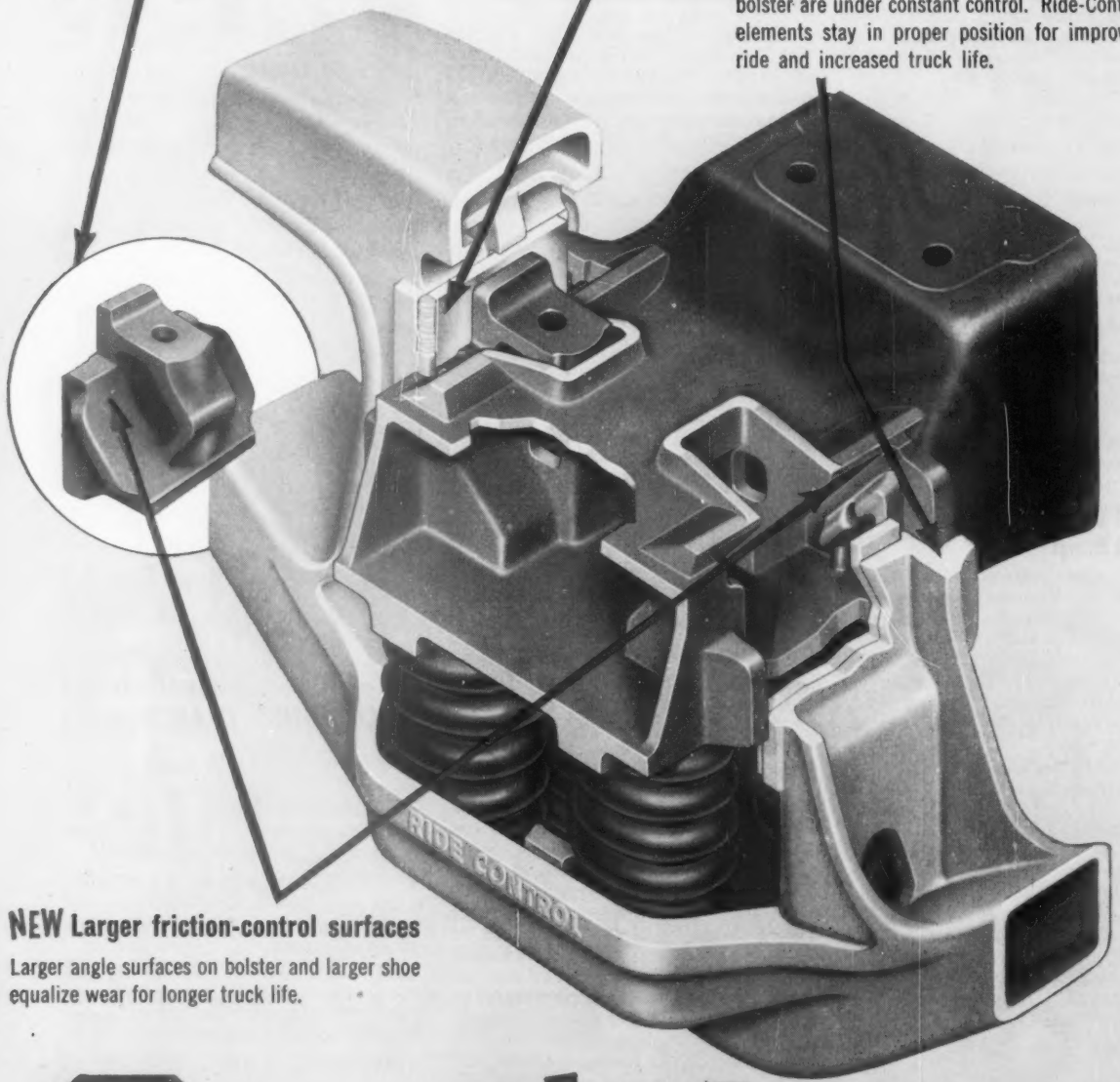
Steel composition and heat treatment developed for wear resistance, yet the plate is readily weldable.

**NEW Wing shoe is shell-molded**

Larger areas—plus ASF's precision casting process that results in smoother surfaces and closer tolerances. New longer-wearing steel, too.

**NEW Superior bolster control**

Longitudinal, lateral and rotary movement of bolster are under constant control. Ride-Control elements stay in proper position for improved ride and increased truck life.




**NEW Larger friction-control surfaces**

Larger angle surfaces on bolster and larger shoe equalize wear for longer truck life.

# NEW ASF Ride-Control Truck

**AMERICAN STEEL FOUNDRIES**

Prudential Plaza, Chicago 1, Illinois

Canadian Manufacturer and Licensee: International Equipment Co., Ltd., Montreal 1, Quebec
Other Foreign Sales: American Steel Foundries, International, S.A., Chicago

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MEMBER

# New ASF Ride-Control® Truck gives you larger bearing areas, better shoe and bolster action. Result: Longer truck life.

Based on 20 years' experience with Ride-Control Trucks and continuing research, American Steel Foundries has designed the new ASF Ride-Control Truck to answer your needs for a lasting smooth ride. Bearing areas have been increased, critical wear points now last longer than ever. Shoe and bolster interaction has been improved, bolster shift minimized. You get balanced wear with lower maintenance costs because of longer life of the component truck parts. The new ASF Ride-Control Truck has been tested and proved in action on the ASF Service Laboratory Test Train, and is ready to give you even better service.

See it at the Allied Railway Show!

PORTABLE GRACO Hydra-Spray pumps paint direct from original 5-10 gal. pail. Larger model pumps direct from 55 gal. shipping container.

**What you should know about a revolutionary new way to**

# SPRAY PAINT

**GRACO** design engineers and test laboratory technicians have worked hand-in-hand for years in developing high pressure, abrasion resistant pumps . . . pumps that can handle almost every conceivable type of material.

This GRACO engineering "know-how" has lead to the development and perfection of the Hydra-Spray Process.

Acclaimed as the most important development in its field in over half a century, it's a system of atomizing and applying paints and protective coatings *without using compressed air* as a propelling atomizing agent.

**How it works.** Spraying is done by release of high fluid pressures in the same way you atomize water into a fine spray when you adjust your garden hose nozzle.

Big difference is that while garden hose pressure is only 50 to 80 psi, Hydra-Spray uses pressures of 1500 to 2000 psi . . . hitherto unknown in the field of spray painting.

**What it means.** The Hydra-Spray Process has many advantages over conventional systems:

- Virtually eliminates "fog" and overspray.
- Applies uniform, heavy film . . . 3 mils, 6 mils, 10 mils. What is your requirement?
- Requires low volume of air . . . only about 5 cfm per spray gun.
- No atomizing air required.
- No paint heaters required.

**Pays for itself.** Users report paint savings of 30% and more.

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**GRAY COMPANY, INC.**

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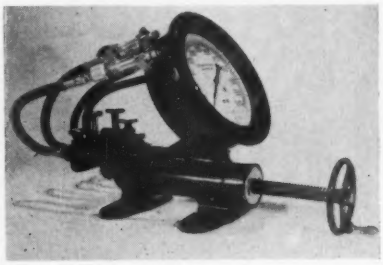
929 Graco Square • Minneapolis 13, Minn.

*Representatives in:* New York, Philadelphia, Washington, Cleveland, Chicago, Louisville, Houston, St. Louis, Minneapolis, St. Paul, San Francisco and Montreal.


## What's New

(*Continued from page 103*)



### Gage Tester

The Prime-McIntyre PM-502 gage tester is a compact, portable tool designed to eliminate the need to remove gages from the locomotive for quarterly testing. It is furnished complete with a four outlet manifold, four 12-in hoses, 600-lb test gage and carrying case. A red anodized fitting is supplied and becomes a permanent part of the gage or pressure switch on the locomotive. The device can test two duplex gages at the same time and can be used to test panel or wall mounted gages. The gage on the tester is a plug-in type for quick change out with gages of other pressures. It can be calibrated by equipping the dead weight tester with Prime gage fittings. Gage ranges of 30, 100, 200, or 400 lb and hose lengths of 2, 3, 6 and 12 ft are available. The gage tester is said to comply with ICC regulations for testing air gages. *Prime Manufacturing Co., Dept. RLC, 1669 South First st., Milwaukee 4.*

### Floor Covering

Froscote floor covering is designed for filling depressions and coating surface of nailable-steel box car floors, and for resurfacing worn and rough-wood box-car floors. It is a mastic emulsion, combining abrasive pigments with plastic binders. It is odorless, non-toxic, non-flammable, and dries to walk on in from 4 to 6 hr; overnight for loading. It is available in 5-gal pails and 55-gal open-head drums. *Frost Paint & Oil Corp., Dept. RLC, 1209 Northeast Tyler, Minneapolis 13, Minn.*

### Slow-Speed Indicator

The Weston Model 273-D slow-speed indicator for hump service is located on the front wall of the cab of a switching locomotive. It indicates the first three mph calibrations very broadly so that speed can be determined within fractions of a mile and is so wired that speed indication is made both for forward and backward movement through the reverser in electrical cabinet. The generator, located under the cab floor, is a direct current Weston Model 750, Type W. Recorder friction is obtained through an 8-in. diameter wheel driving on the diesel


# NEED ADDITIONAL CAB HEAT?

The Convectair Cab Heater puts the HEAT around the FEET.

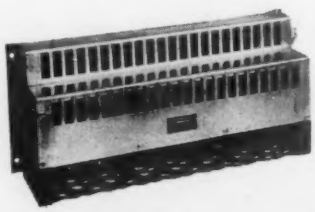
No Moving Parts—Low First Cost —Low Maintenance.

Full Heat is obtained in below zero weather—Independent of Engine Water Temperature.

Heaters with capacity of 1.6 to 2.0 K.W. are satisfactorily supplied from Auxiliary Generator—Reverse Current Relay Protects Battery.

If you have a Cab Heater Problem—We may have the solution.

**CONVECTAIR**
**ELECTRIC HEATER**
**FOR**
**LOCOMOTIVE CABS**



**"It Warms the Man First"**

**OGONTZ CONTROLS COMPANY**

**8029 YORK ROAD • ELKINS PARK • PHILADELPHIA 17, PA.**

truck wheel. At speeds from 1 to 50 mph, revolutions per minute on a 40-in. diesel truck wheel range from 8.4 to 420. *Barco Manufacturing Co., Dept. RLC, 500-530 North Hough st., Barrington, Ill.*

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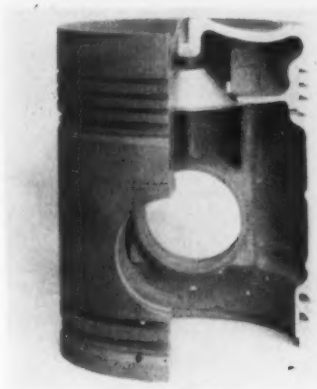

## Ductile Iron Piston

Ductile iron replacements for aluminum pistons, which have been used satisfactorily in the B-L-H 600 series engine for several years, are now available for the Alco 244 type engines in a two-ring design. The piston material has an ultimate strength of 100,000 lb; a yield strength of 75,000 lb; Brinell hardness 225; elongation 4 per cent, and an endurance limit of 35,000 psi. *Hunt-Spiller Manufacturing Corp., Dept. RLC, 383 Dorchester ave., Boston 27.*

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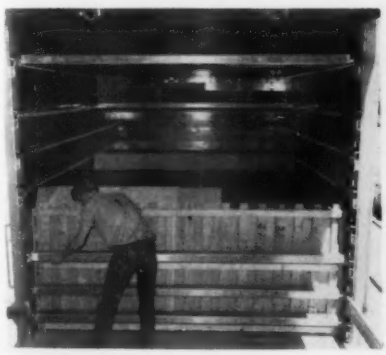


## Lading Equipment

Car-Pac, a damage-free type lading equipment, is said to eliminate load shifting and wasted loading space resulting from bulky wood bracing methods. Mixed and stop-off shipments can be handled in the same load. Lightweight, tubular, extruded aluminum cross-members, which can be handled by one man, are used to secure the lading. They extend transversely across the car and lock securely into channel-type belt rails which are flush with the ¾-in. standard box-car lining. Locating hooks in the cast-steel heads of each cross-member are off center, providing take-up of small distances by turning the cross-member end-for-end. Each cross-member weights only 38 lb, but can safely retain a dead-weight load of 4,000 lb

(*Continued on page 110*)


BRAKE BEAM HANGERS

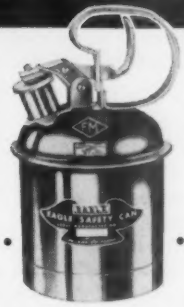
BRAKE PINS

"EXTRA" METAL AT CRITICAL POINTS
IDENTIFY FLANNERY BRAKE BEAM HANGERS

Flannery provides additional metal at points where most wear occurs to upgrade operational safety and extend brake service life. Even after heavy use, a greater amount of cross-sectional metal remains on Flannery units than on most conventional AAR-approved brake beam hangers. Carefully selected steel, heat treated at controlled temperatures, assure maximum service life. "U" type Flannery hangers available in six to eighteen inch lengths; "Loop" types from eight to fourteen inches. Round and square-head Flannery Brake Pins furnished in any desired length.

FLANNERY PRODUCTS CORPORATION
RAILROAD SPECIALTIES
P. O. BOX 5103, NEWARK 5, N. J., Telephone MArket 3-0333 / PLANT: BAYONNE, N. J.

Quality cans
EAGLE SAFETY CANS

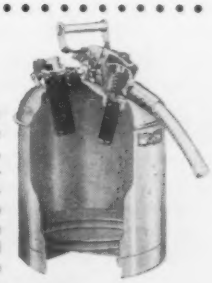


The approved *safe* way to handle flammable liquids • Listed by Underwriters Laboratories • Approved by Factory Mutual • Uncommonly rugged for hard use • 'The Complete Line'

STYLE I
STORAGE CAN
1 qt., 2 qt., 1 gal. sizes with trigger-grip handle . . . 2½ gal., 5 gal. sizes with free-swing handle . . . valve operated by handle gives positive pouring control . . . no waste, no splash, no spill . . . strong quality construction.

ORDER FROM YOUR SUPPLIER

STYLE II
FILLER-
DISPENSER CAN
2½ gal., 5 gal. sizes with free-swing handle . . . flexible spout for easy pouring . . . body and breast each seamless drawn from heavy 24-gauge steel . . . steel hoop reinforces bottom . . . fire screens in pour spout and filler opening for double fire protection.



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BADLB MANUFACTURING CO. Wellsburg, W.Va.
Serving Industry Since 1894

# 3-way proven protection

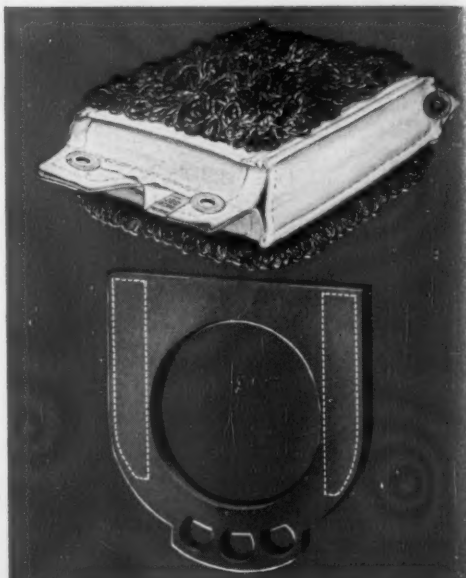
## FOR JOURNAL BOXES *with*

# JBS

## ACME LUBRICATORS

***(AAR Conditionally Approved)***

JBS Acme Journal Lubricators* alone have the exclusive batted 100% wool quilted core which retains four times its own weight in oil reserve. Heavy chenille loop surfaces of 30% wool and 70% cotton assure constant resiliency and an ample supply of filtered oil at all times even at a temperature of 45° below zero. The rectangular shape of JBS Acme Lubricators is particularly designed to insure snug fit and prevent displacement in the journal box. They require no modification of the standard journal box, and assure better performance with less servicing. **Patent pending*



## AXLE-STOP DUST GUARDS

The installation of Axle-Stop Dust Guards as a combination dust guard and axle stop limits the free motion of the journal, wedge and brass upon impact and brake application. Instead of the brass and wedge taking the shock of impact, two steel inserts positioned in the Axle-Stop Dust Guard absorb the shock, prevent the cocking of the brass and definitely lessen the possibilities of a hot box. Bearing distortion is eliminated, permitting it to assume its full crown and attain a life which has never before been possible.

## RECLAMATION SERVICE

Journal Box Servicing Corporation is a veteran of more than 30 years' experience in reclaiming car oils and waste. Today, its 17 plants, strategically located in 14 states, are performing the same highly efficient and economical function for lubricator pads, restoring them to their original usefulness at a small fraction of their original cost.

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Railroading's

# Next Area of Dramatic Economy

RMC

## One-Spot Car Repair System

All repair work is done under direct supervision in a well-equipped and supplied shop.

*An estimated 100% return per year* ... plus absolute safety and better working conditions! System covered by patents applied for.

**Railway Maintenance Corporation**

BOX 1888 PITTSBURGH 30, PA.

(*Continued from page 107*)

against horizontal movement, or carry a vertical load of 3,000 lb when used to support an upper deck.

Wooden deck boards, secured or supported by the cross-members, hold the lading in place in any section of the car. An interlocking feature of the deck boards permits floor-to-ceiling bulkhead construction for special requirements. *Pacific Car & Foundry Co., Dept. RLC, Renton, Wash.*

---

## Brake Cylinder Release Valve

The Sloan Caco brake cylinder release valve, interposed in the car's brake system, is designed to bleed the air in the brake cylinder only while retaining the air in the AB valve and air reservoirs when a car is cut from a train. Because most of the air is thus retained, much time is saved both in the bleeding operation and in the recharging of the brake system when a train is made up and preparing to move. *Sloan Valve Co., Dept. RLC, 4300 W. Lake st., Chicago 24.*

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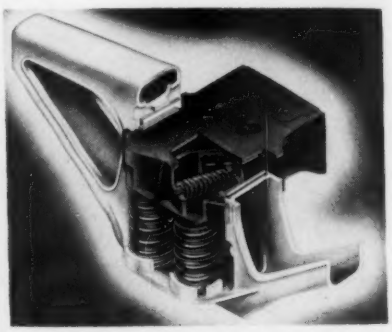


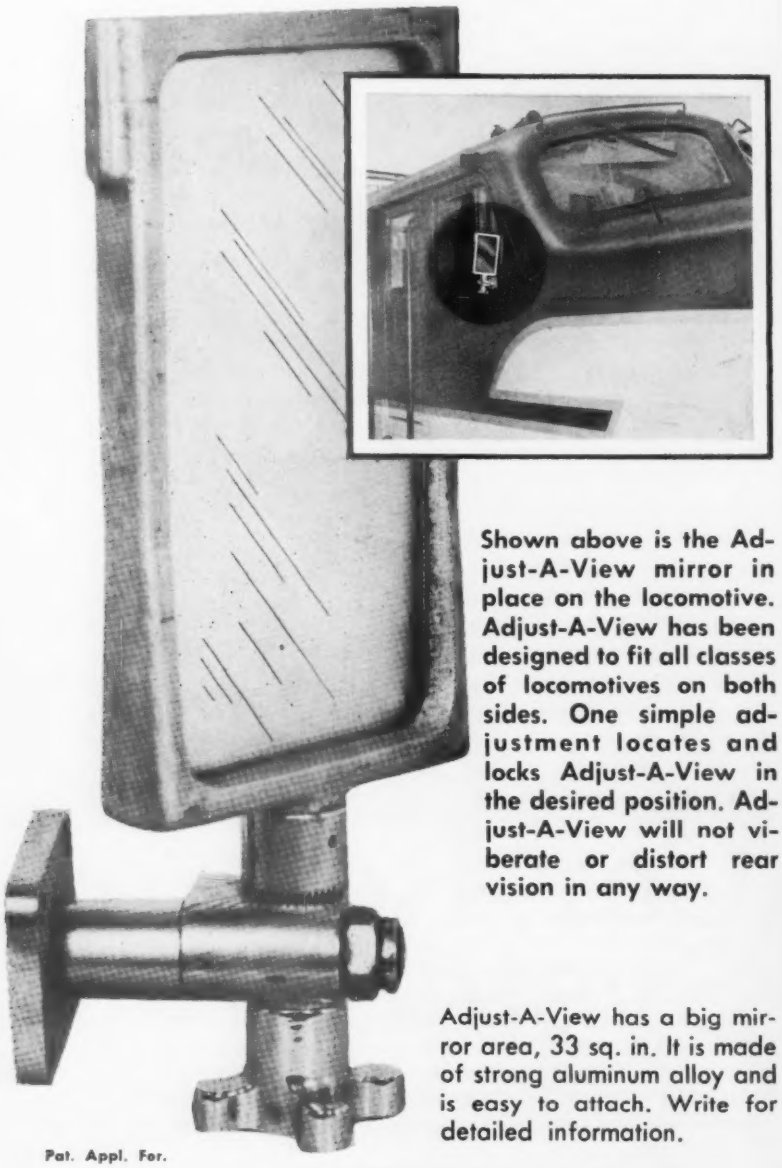
## Freight-Car Truck

The new Scullin C-C (Constant Control) truck, according to official AAR road tests, has low lading damage index ratios—vertical .44; lateral .43. Snubbing is provided by wedge-shaped friction castings which exert a restraining action on vertically positioned hardened steel wear plates in the side frame columns. Integrally cast pockets in the ends of the truck bolster hold the

(*Turn to page 112*)


# ADJUST-A-VIEW REAR VIEW MIRROR

*An adjustable rear vision mirror designed to fit the individual needs of ALL engine men.*



Pat. Appl. For.

**Shown above is the Adjust-A-View mirror in place on the locomotive. Adjust-A-View has been designed to fit all classes of locomotives on both sides. One simple adjustment locates and locks Adjust-A-View in the desired position. Adjust-A-View will not viberate or distort rear vision in any way.**

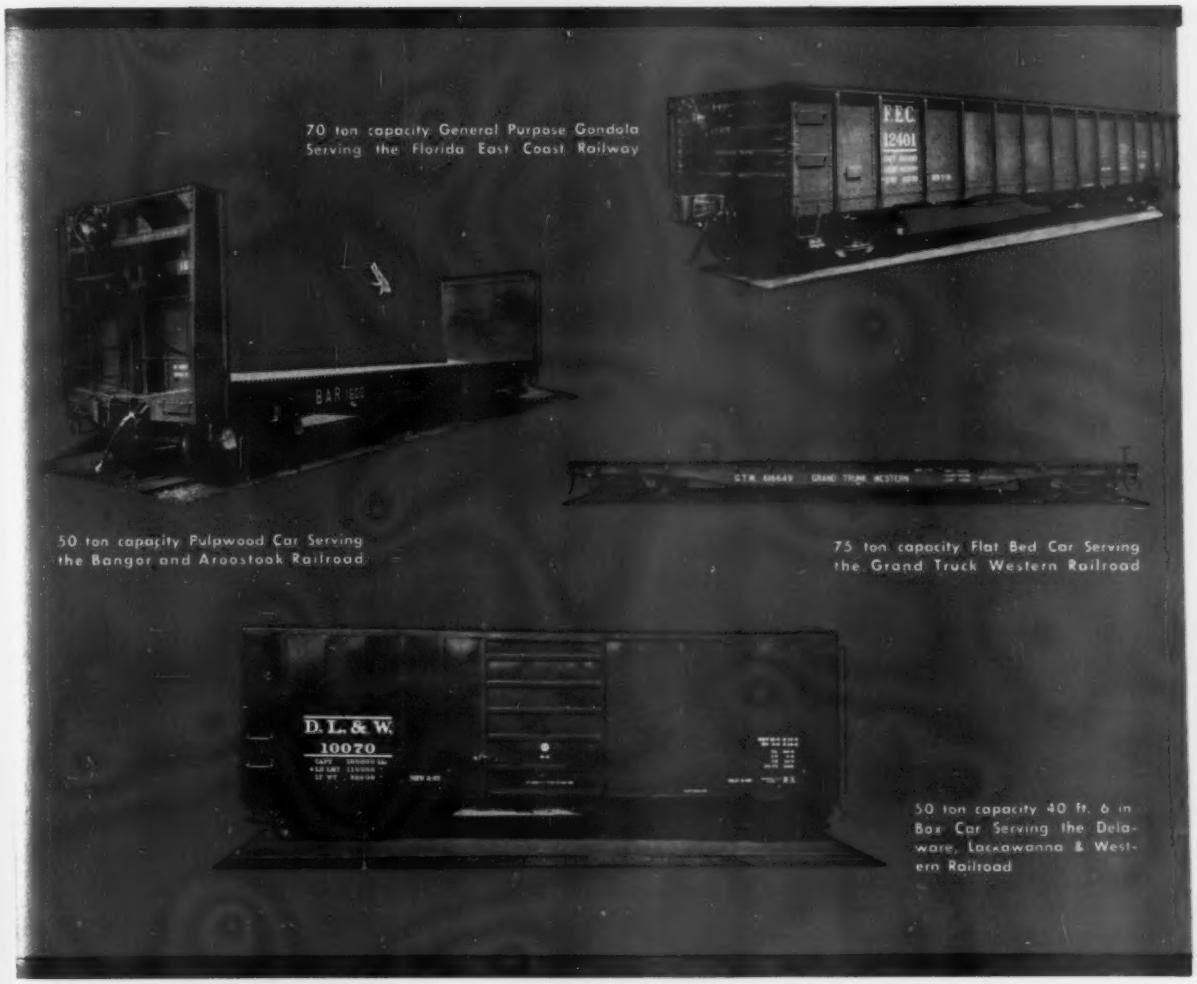
Adjust-A-View has a big mirror area, 33 sq. in. It is made of strong aluminum alloy and is easy to attach. Write for detailed information.

## TRANSPORT PRODUCTS CORPORATION

3008 MAGAZINE ST. • LOUISVILLE, KY.

# MAGOR CARS

## FOR DEPENDABLE SERVICE


70 ton capacity General Purpose Gondola
Serving the Florida East Coast Railway
FEC
12401
50 ton capacity Pulpwood Car Serving
the Bangor and Aroostook Railroad
75 ton capacity Flat Bed Car Serving
the Grand Truck Western Railroad
D. L. & W.
10070
50 ton capacity 40 ft. 6 in.
Box Car Serving the Dela-
ware, Lackawanna & West-
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**Standard, special or custom made – Magor makes a complete line of freight cars to the most rigid specifications.**

**The engineering know-how and manufacturing skills of 56 years experience stand behind the Magor promise of dependability!**

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***The Magor Car Corporation welcomes the opportunity of submitting estimates, specifications and recommendations tailored to meet your requirements.***
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# Here's a 100% Annual Return . . .

**. . . In direct savings on fuel, air, burned rivets, and waiting time. The Cheston Electric Rivet Heater pays for itself within one year.**

The Cheston reduces rivet-heating costs to small change—15¢ or less per 100 lbs. of rivets. This is the total cost—no preheating expense, no air, no burned or coked rivets, and no Waiting Time losses, as the Cheston is ready for immediate action whenever needed, produces heated rivets within seconds of starting-up.

Equally important, the Cheston Rivet Heater is cool and clean and comfortable to work with. It totally eliminates heat-blast, fumes, smoke, filth and fife hazards, vastly improving shop working conditions and simplifying housekeeping chores.

The five-electrode model shown above will handle the busiest positions on your new car and heavy repair lines—or look after two riveting gangs simultaneously on many classes of work. It is the real workhorse of the railroad industry.

The two-electrode model shown on the right is ideally suited for your Rip Track Repair Stations, or short order duty in yard or shop. Just roll it up to the car and get out the work with no delays and no nonsense.

Whatever the position or workload, there is a Cheston Electric Rivet Heater specially designed for it, and handsome dividends to be gained.

**WRITE FOR DETAILS TODAY.**

**FRANK C. CHESTON COMPANY**

60 PARK PLACE Newark 2, New Jersey


*(Continued from page 110)*

friction castings, with their component springs, in a horizontal position.

The truck is available either with conventional journal boxes or in pedestal design for the application of roller bearings. Any AAR standard long travel springs can be used. Castings can be furnished either in Grade B or high-tensile steel. No spring planks or spring plates are required. Both side frames and bolsters meet all AAR specifications. *Scullin Steel Co., Dept. RLC, 6700 Manchester ave., St. Louis 10, Mo.*

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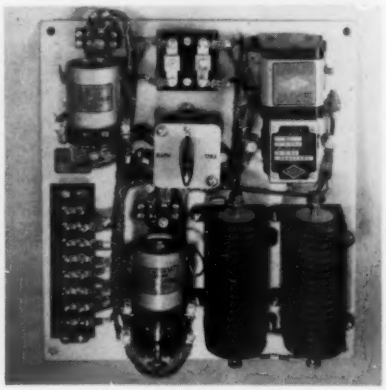


## Engine Temperature Control System

The engine temperature control system maintains diesel locomotive engine temperatures by automatically controlling the radiator shutters and cooling fan. The unit, which is available for all types of diesel locomotives, consists of a panel and mercury thermostat and is vibration and shockproof. The control panel is 10-¾ in. wide, 12 in. high, and 3 in. deep. *Vapor Heating Corp., 64200 W. Howard st., Chicago 48.*

---

## Shipping Rack

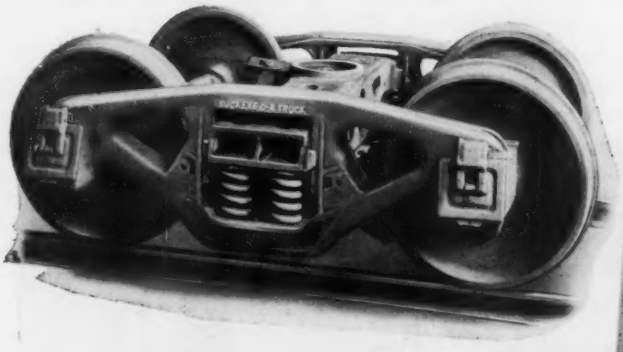
The Rak-Loc shipping system is being used by some automobile companies for the shipment of engines, axles, hub and drum assemblies, etc. Rails of ¼-in. steel hold en-

*(Continued on page 115)*

# ANOTHER Buckeye EXTRA

..AT NO EXTRA COST!

## ACCURATE UNIPLANE* JIG GRINDING OF JOURNAL BOX LID FACE IMPROVES CLOSURE



*First featured on Buckeye's famed C-R (Cushion Ride) truck now standard process on all Buckeye trucks with integral journal boxes

FOR COMPLETE INFORMATION . . CALL or WRITE

*Refer Adv. No. 11872*

The Buckeye Steel Castings Co.

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COLUMBUS, O.
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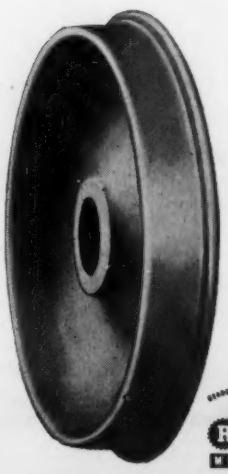
# You don't have to hunt 'em like you used to!

Yes . . . the day of the big tape size hunt—with the railroads holding the bag—is a day of the past.

That's because Griffin figured out a way to cast the new EQS virtually to specified size. (That may sound easy, but it wasn't. Wheel producers had been trying to do it for years.)

Naturally, having fewer tape sizes simplifies your wheel inventory . . . as well as saving time and tempers.

Saves *money*, too . . . because if you want to see a wheel that stubbornly stands up under high speeds and heavy loads, try the Griffin EQS!



**GRIFFIN EQS**

E LECTRIC Q UALITY S TEEL

**GRIFFIN WHEEL COMPANY, 445 N. Sacramento Blvd., Chicago 12, Illinois**

In Canada: Griffin Steel Foundries, Ltd., St. Hyacinthe, Quebec

*Give the "green" to GRIFFIN and watch your costs go down!*

RECEIVED TO PRODUCTION RMI MEMBER

(*Continued from page 112*)

gine racks. T-shaped forgings are welded to each side of the racks to fit into slots staggered in the belt rails. Spacing on the forged tees is narrower than the centers of the slots. On impact, the shock is absorbed in two rear forgings. The racks can't roll whether filled or empty. They are designed, and fabricated by the manufacturer to whom the cars are sent for installation of the fixed equipment. *Whitehead & Kales Co., Dept. RLC, 58 Haltiner st., Detroit 18.*

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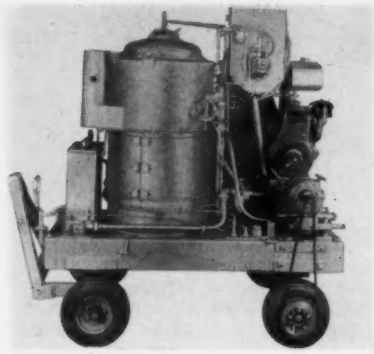

## ydraulic Cleaner

he self-propelled Upgrader Senior hy-raulic cleaner for freight cars generates its wn high-pressure steam and combines it ith cold water in a Sellers injector. The eam both heats the water and forces it rough the hose and cleaning lance at 250 si. The lance discharges a controlled stream f 1,500 gal of 180 deg water per hr.

The unit is powered by a 5-hp (at 1,750 pm) four-cycle gasoline engine. For stand-y and emergency steam it has a rating of 35 hp, or 1,000,000 Btu per hr at 100 to 125 si. Fragile equipment can be cleaned with ot mist, using low impact pressure and team.

On towed and basic units, power is sup-lied either with an electric motor or gaso-line engine. Portable models are oil-fired nly (No. 2 fuel oil). Stationary models may be oil or gas-fired, or both. *Vapor Heating Corp., 6420 W. Howard st., Chicago 48.*

---

## Brake Regulator

The H & L Peacock brake regulator Model 1340 is double-acting and fully automatic. It will maintain a pre-selected piston travel at all times and will instantly and completely adjust the piston travel, regardless of the wear, number of shoes lost or replaced. Shoes can be replaced without touching the regulator in any way. No manual manipulation is required either to replace the shoes or to re-establish the piston travel. The device is lubricated for the life of an air-brake cleaning period and likewise tested to

**It's What they DON'T DO that CUTS YOUR OPERATING COSTS!**

Actually, the most important thing a diesel electric brush can do is to do nothing that will cause you a lot of extra commutator reconditioning costs. And that's exactly what Stackpole Brushes are designed for in fullest measure.

Frequently — especially under difficult service conditions — Stackpole Brushes have actually improved bad commutator conditions that developed when other brushes were used. Moreover, under any operating condition, they are exceptionally kind to commutators. In every case, they assure maximum mileage consistent with uniformly smooth, burn-free commutation — *and that's by far the best way to reduce operating costs where brushes are concerned!*

**STACKPOLE CARBON COMPANY • St. Marys, Pa.**

**STACKPOLE** *diesel-electric* **BRUSHES**

Brushes for all rotating electrical equipment • Electrical contacts • Rail-bonding molds
Seal rings • Welding & Brazing tips • Graphite bearings • Voltage regulator discs
Anodes for electrochemical cells • Heating elements & Electrodes • Rocket nozzles
Friction segments • Dozens of Electrical & electronic components . . . and many more.

SPECIFY
STRATOFLEX
"275"
FLEXIBLE HOSE ASSEMBLIES
for maximum air brake dependability!
Stratoflex "275" wire braid hose, with SF 426 and 435 reusable fittings, meets standard applications for railroad air brake lines. Hose is made from seamless synthetic rubber innertube, reinforced with one fabric braid and one high tensil steel braid in sizes -10 and -12. Sizes -16 and -24 are reinforced with two steel wire braids. Write for detailed information.
Left—High pressure surge testing hose assemblies at Stratoflex plant.
STRATOFLEX Inc.
P.O. Box 10398 • Fort Worth, Texas
Branch Plants: Los Angeles, Fort Wayne, Toronto
In Canada: Stratoflex of Canada, Inc.
SALES OFFICES: Atlanta, Chicago, Cleveland, Detroit, Fort Wayne, Fort Worth, Houston, Kansas City, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Seattle, Toronto, Tulsa


operate at 100 psi pressure on a 12-in. cylinder. It will not slip under impact and does not reduce the air-brake force on the rigging more than allotted by the AAR. It is covered by AAR Certificate No. 6. *Ellcon-National, Inc., Dept. RLC, 30 Church st., New York 7.*

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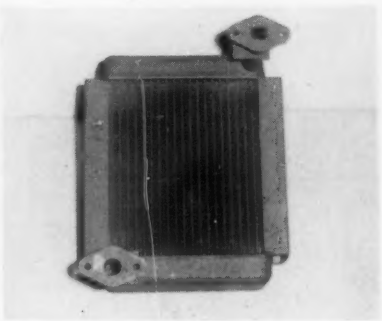

Cab heater replacement cores, both for EMD and Alco locomotives, feature cast-brass tanks, all copper cores, and silver solder construction. Dished header water radiators for replacement use on Alco 244 engines are also available. *Kelty Radiator Co., 312 11th ave., S.E., Cedar Rapids, Iowa.*

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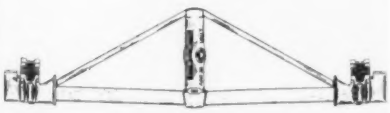

Unit No. 36 is a high-capacity brake beam for 90- and 100-ton freight cars of all types. It is a 36,000-lb unit designed on the same principles as the present unit Nos. 18, 24 and 28. *Unit Truck Corp., Dept. RLC, 140 Cedar st., New York 6.*

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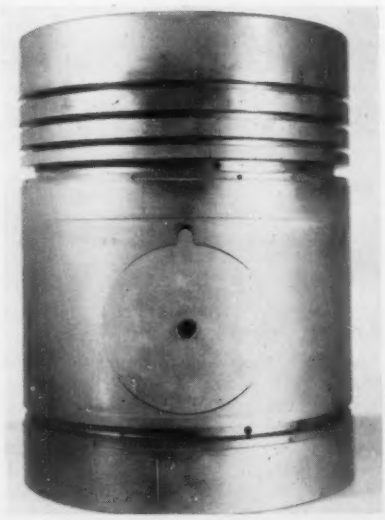


G-583 high-alloy cast-iron piston for Alco series No. 244 engines. *Gustin-Bacon Mfg. Co., Dept. RLC, 210 W. 10th st., Kansas City, Mo.*

(Continued from page 10)

district, New York; *Ralph H. Frank*, Central district, Pittsburgh; *James M. Dickey*, Midwest district, St. Louis, and *Carl B Haugh*, Western district, Los Angeles.

■

GENERAL MOTORS CORPORATION, ELECTRO-MOTIVE DIVISION. — On October 21 Electro-Motive will receive from the Franklin Institute the George R. Henderson Medal "For the conception and demonstration of the feasibility of utilizing diesel-electric locomotives on a wide scale in this country and for the design, development, standardization, producing and servicing of these locomotives."

*Kenneth J. Wolf*, appointed manager of product application section of sales department. *Warren A. Fox*, supervisor, succeeds Mr. Wolf as manager of sales engineering section.

■

AIRCAIR CO.—*Donn Fraser* appointed field representative in Canada.

■

ELECTRIC STORAGE BATTERY CO., EXIDE INDUSTRIAL DIVISION.— A new battery and charger service station-warehouse, to serve New York metropolitan area, opened at 34-11 62nd street, Woodside, L.I., N.Y., in charge of H. H. Warren, New York branch sales manager.

■

ALCO PRODUCTS, INC.—Pittsburgh district office relocated in Building 1 at Parkway Center, 875 Greentree Road, Pittsburgh 20.

■

ERENCO, INC.— *John P. Chadwick, Jr.*, 3705 Russell Road, Alexandria, Va., and *Ray L. Hillpot*, 23 Park Drive, Lansadale, Pa., appointed manufacturers representatives.

■

FAIRBANKS, MORSE & CO.—Plans completed for the establishment of a central research and development in a 20,000-sq ft building at Beloit, Wis., works.

■

GREENVILLE STEEL CAR CO.—*John T. Kolb*, assistant mechanical engineer, appointed mechanical engineer, succeeding *Paul W. Hinman*, retired.

■

PYLE-NATIONAL CO.—*Eugene P. Callahan*, sales representative in Cleveland district office, named manager of newly opened district sales office in Comer Building, Birmingham, Ala.

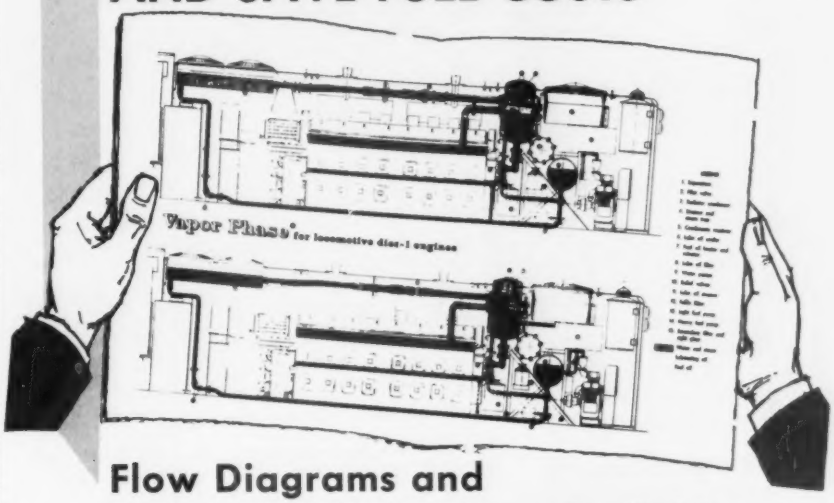
■

CRUCIBLE STEEL CO. OF AMERICA. —*William R. Mogg*, sales manager, appointed general manager, Spring Division.

■

JOYCE-CRIDLAND CO. — *Robert M. Tormey* appointed sales manager of newly formed Industrial division, which incorporates sales and administrative functions of Railroad and Industrial Jack and Materialift divisions. *John M. Miller*, former sales manager, Materialift section, now general sales manager of firm.


# LEARN HOW VAPOR PHASE® CAN IMPROVE DIESEL PERFORMANCE AND SAVE FUEL COSTS

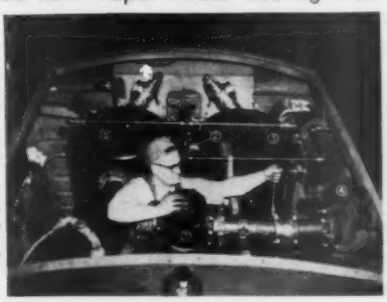



## Flow Diagrams and Technical Bulletins Now Available!

Write **today** for this informative literature that gives you detailed descriptions of Vapor Phase Cooling and how it reduces maintenance and fuel costs on Diesel Locomotives.

Vapor Phase Cooling is entirely automatic and uses the natural law of boiling water for temperature control of jacket water. Immediate benefits of Vapor Phase are savings in fuel costs because cheaper residual blends can be more effectively used; reduction in engine wear; and cleaner operation. The flow diagram is printed in three colors to graphically demonstrate Vapor Phase operation.

The technical bulletin tells how Vapor Phase Cooling was tested for over a year on a Great Northern Locomotive and how it proved its value by reducing maintenance and substantially cutting fuel costs. As a result of the test's success, Engineering Controls, Inc. has developed a "package" Vapor Phase System for Diesel Locomotives.



*To Get Your FREE Vapor Phase Flow Diagram and Technical Bulletin . . .*
*WRITE TODAY TO . . .*

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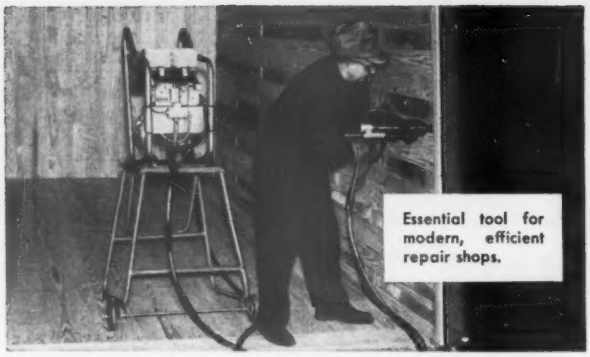
**ENGINEERING CONTROLS, Inc.**

611 E. Marceau, St. Louis 11, Mo.
1939 N. Hillhurst Ave., Los Angeles 27, Calif.




## POWASERT® AUTOMATIC NAILER

### Saves 5½ Man-hours per 8 hour day... on Box Car Relining

One man can reline a box car in 2½ man-hours with a Powasert Automatic Nailer. The same job with hand nailing takes 8 man-hours.

Powasert Nailers cut worker fatigue — reduce back-breaking labor which builds up costs. You can free one or two men who ordinarily do just nailing for other work.

Powasert Nailers will drive up to 50 8-penny nails a minute. Nails are dumped into the feeder-separator unit and fed automatically to the gun. Gun works by merely pressing nose against work and squeezing trigger.

Powasert Automatic Nailers pay for themselves in a short time. Call or write us today for a demonstration.

Powasert Automatic Nailers start at $1195 with feeder-separator. Operates best from 95-120 PSI clean, dry air.

**United**

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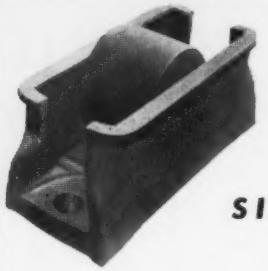
Dept. RC, 140 Federal Street, Boston, Mass. • Liberty 2-9100 US 9-59



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### SIDE BEARINGS

FOR PROVEN DEPENDABILITY
- LONG LIFE
- HIGH CAPACITY
- FREE SWIVELING TRUCKS

MATERIAL:
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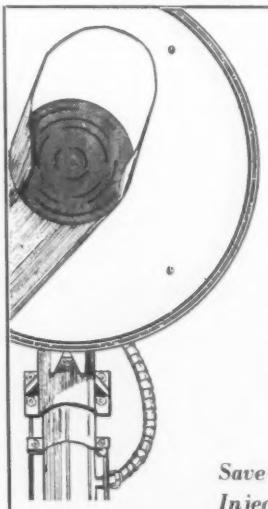
- ROLLED STEEL

A. STUCKI CO.

OLIVER BLDG.
PITTSBURGH, PA.



*You'll get the "green" all the way on this offer!*

**EMD PLUNGER AND BUSHING ASSEMBLY EXCHANGE RECLAMATION**

EMD #5227853—567 STD
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**$8.50**

No Chroming—
Strictly Re-mating—
Guaranteed 90% Return

Our customers are assured complete satisfaction. Re-conditioned assemblies can be shipped for test purposes with delayed billing . . . returnable at no charge if not satisfactory.

**NEW EMD ASSEMBLIES $15.00**
(Same Units as Above)

*Save one-half on EMD Injector Valve Springs!*

Our own improved EMD injector valve spring . . . #5228016 . . . is used exclusively by five of the larger Eastern railroads with complete satisfaction. Half the price of the EMD's. Manufactured of Chrome Vanadium Steel **60c**

We offer complete coverage on all EMD injector parts! For details on this program and our complete line of fuel injection equipment, visit our exhibit booth at the Allied Railway Supply Association convention.

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# 95% OF ALL MODERN DIESEL LOCOMOTIVES ARE EQUIPPED WITH Sprague AIR-PUSH WINDSHIELD WIPER MOTORS

SAFETY STARTS WITH SEEING!

Sprague DEVICES, INC.
MICHIGAN CITY, INDIANA

# Letters

## No More Retainers?

To the Editor:

Are retainer valves on box cars still necessary? With the advent of pressure maintaining for the 24-RL brake valve, I wonder if it is now necessary to set up retainer valves on long grades.

If not, couldn't the retainer valve be eliminated from cars? There would be quite a few benefits for the railroads. Roughly speaking, the cost of a retainer valve and the labor involved in its application to a car would be about $30. Other savings would be involved in elimination of freight-train delays. There isn't a day goes by that we don't have a delay involving retainer valves on this region.

**L. G. Fortune**
***San Antonio, Texas***

[At the recent AAR Mechanical Division meeting it was revealed that consideration is already being given to locating retainer valves so they can be reached from the ground (RL&C, July 1959, p 28). Editor.]

## Erie Freight Car Shop

To the Editor:

We have read with great interest the article on the new freight car shop opened by the Erie at Meadville, Pa., appearing in the February 1959 issue of your journal.

**N. N. Tandon**
***Secretary, Railway Board***
***Ministry of Railways***
***New Delhi, India***

## RL&C in South Pacific

To the Editor:

We are very isolated in this part of the world and the only manner in which we can keep abreast of latest developments is through technical publications. I have managed to get on a circulation list for Railway Locomotives and Cars, and I was able to obtain the latest Locomotive Cyclopedia so that I now have a copy of "How To Keep 'em Rolling."

**C. J. Alcock**
***Assistant engineer, District***
***Mechanical Engineers Office***
***New Zealand Railway Dept.,***
***Wellington, N. Z.***

## Electric Fuel Cut-Off

To the Editor:

In your July issue there was an article with regard to the electrical fuel cut-off system on locomotives which was recently installed on a Southern Pacific dual fuel locomotive. The article also included the latest ICC rules with regard to the locomotive requirements with respect to emergency fuel cut-off valves.

The electrical fuel cut-off system, while adaptable to a standard domestic locomotive, was developed for a dual fuel locomotive because mechanical fuel cut-off systems can become cumbersome and hard to operate. The system as installed on the SP utilizes the fuel pump as a safety cut-off valve and, since the fuel pumps are made to very


FAST . . . . . Productive

ALL NEW 98

*But, that's not all*

**IT'S RUGGED AND BUILT TO LAST!**

LOOK . . .

- Easy To Transport—Only 180 Pounds
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- Improved Chuck—No Projecting Jaws You Can Work Within 1" Of Face Chip Problem Virtually Eliminated
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# Take a tip from UNION PACIFIC!

## Prevent Sweat Damage to Lading with Frost's *Insulcote!*

One of the ways Union Pacific prevents damage to lading is with Frost's Insulcote . . . the modern undercoating for metal boxcar roofs.

Insulcote is an emulsion-type plastic coating that actually absorbs moisture, preventing condensation that can result in freight damage. Unlike asphaltic-type materials, Insulcote will not dissolve in mineral solvents and fumes. It adheres tenaciously to galvanized metal surfaces under any conditions.

Insulcote is safe, clean, non-inflammable. It is easy to apply with heavy-duty spray gun equipment and requires no preliminary acid treatment of the galvanized metal surface. The roof of a 40-foot boxcar can be undercoated with Insulcote in less than 15 minutes.

Frost's Insulcote is light tan in color to match car linings. It is available in 5-gal. steel pails and 55-gal. open-head steel drums.

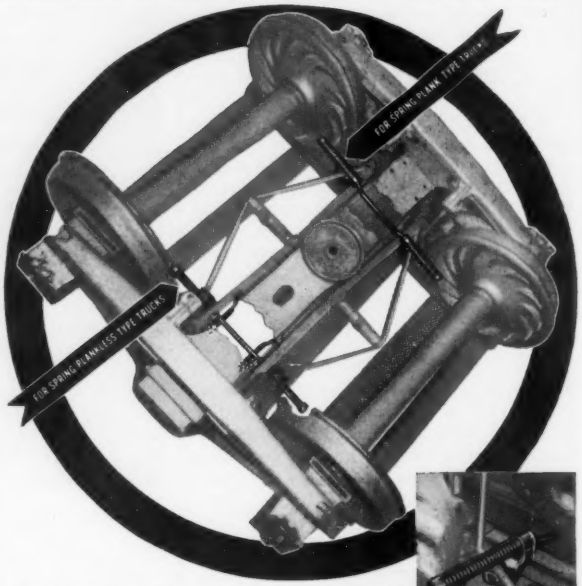
*Other* **FROST RAILWAY SPECIALTIES**

- **NO-RUST** Car Journal Compound
- **VERNIX** Floor Hardener
- **SURE-FOOT** Non-Slip Paint
- **FROSCOTE** Floor Covering

**SEE US AT BOOTH NO. 155 ALLIED RAILWAY SUPPLY CONVENTION**
**HOTEL SHERMAN, CHICAGO—September 20-23**

**Frost** PAINT & OIL CORPORATION
1209 N.E. TYLER
MINNEAPOLIS 13, MINNESOTA

# THE IMPROVED GRIPCO BRAKE BEAM SAFETY SUPPORT




The Gripco Brake Beam Safety Support provides the greatest safety at lowest cost. Its dependability has been proven over years of actual service. Gripco Safety Supports are low in original cost, low in application cost and low in maintenance cost, even after years of service.

SPRING-PLANK TYPE

## ENGINEERING IMPROVEMENTS

1. One design fits both 5'-6" and 5'-8" wheel base trucks.
2. One rod length and one spring length. One interchangeable casting fits both spring plank and spring plankless trucks.
3. Ideal for interchange repairs. New design permits easy and fast applications under all conditions. Nuts need not be removed to apply or remove the support.

SPRING-PLANKLESS TYPE
(Safety Loops Included)

## OUTSTANDING FEATURES

1. An inexpensive trouble-free support for Rebuilt Car Programs.
2. Designed for spring plank and spring plankless trucks. Spring plankless trucks require safety loops which can be bolted, riveted or welded to the bolster.
3. Supports the brake beam in the event of brake beam or hanger failure.
4. Holds brake beam in horizontal position.
5. Holds brake shoe in proper position in relation to the periphery of the wheel.
6. The brake release feature pulls brake shoes away from wheel contact instantly when brakes are released.
7. Prevents unnecessary wheel and shoe wear caused by dragging brake shoes.
8. GRIPCO supports can be removed and reapplied without removing nuts; therefore nuts are furnished in proper position.
9. Brake beams, rods, and levers are held in position under spring tension thus reducing false movements, chattering and wear of hangers, hanger pins and brake heads.
10. Can replace as a billable repair any support except A.A.R. recommended practice (angle-riveted and welded).

A.A.R. APPROVED—PATENTED AND PATENTS PENDING

OTHER GRIP NUT PRODUCTS AD NO. 110

Grip Lock Nut #1 | Grip Holding Nut #2 | Railroad Gripco Lock Nut #3

# GRIP NUT COMPANY

*Serving American Railroads Since 1904*

**106 BROAD ST., • SOUTH WHITLEY, IND.**

close tolerances and are a positive displacement type, they do provide a very effective cut-off valve. The new electrical fuel cut-off system actually shuts off the fuel pump, making an effective cut-off valve, and at the same time de-energizes the governor solenoid valves to cause the engine to shut down immediately. Therefore, when the emergency fuel cut-off button is depressed, the engine stops immediately and there is no time delay due to fuel trapped in the system.

The emergency fuel cut-off reset is in the cab, and this permits the emergency fuel cut-off to be reset easily, without hazard. The emergency fuel reset is separated from the fuel cut-off push buttons to insure that, in an emergency, there will be no confusion.

**Name Withheld**
***Chicago***

## The 12-Cycle Engine!

TO THE EDITOR:

EMD's new RS-1325, 12 *cycle* engine must be a real eye-stopper (June 1959, p 27), and that PC reset in about one minute with automatic brake valve in emergency (June 1959, p 54). WOW! What's next?

**R. W. Leedy**
***Diesel foreman,***
***Illinois Central,***
***New Orleans***

The RS1325 got 12 cylinders instead of a new combustion principle when we showed on page 28. The process for resetting the PC switch is correct and will be explained in a subsequent 26-L installment. Answering Mr. Leedy's last question: We can never be sure what's next, but then that's why no one should allow his subscription to lapse. —EDITOR.]

# HELPS FROM MANUFACTURERS

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information write direct to the manufacturer.

PAINT STRIPPING. 8-page booklet, "Freight Car Paint Stripping, Spray Tunnel Method," describes and illustrates in detail assembly-line paint stripping of railroad freight cars using Wyandotte spray tunnel method. (Write: Railroad Sales Dept., *J. B. Ford Division, Wyandotte Chemicals Corporation,* Dept. RLC, Wyandotte, Mich.)

FERROFLUX SYSTEM. 4-page Bulletin F-59 describes Ferroflux method of locating invisible defects in ferrous metal parts and assemblies. (Write: *Ferro Machine & Tool Corp.*, Dept. RLC, 5514 W. Washington st., Indianapolis 41, Ind.)

WELDING CARBON PRODUCTS. "Welding Carbon Products Manual" describes use of carbon plates, rods and paste in welding repair work. (Write: *Arcair Co.*, Dept. RLC, Box 431, Lancaster, Ohio.)

JACKS. 8-page Bulletin AD-66a describes the 1800 Series worm gear jack, listing specifications and applications of the jacks ranging in capacity from 2 to 100 tons. (Write: *Duff-Norton Co.*, Dept. RLC, P. O. Box 1889, Pittsburgh 30.)

WELDERS. 4-page bulletin describes construction and operating features, of a new line of welding machines for all manual arc-welding applications. (Write: *Lincoln Electric Co.*, Dept. RLC, Cleveland 17.)

SHAPE CUTTING MACHINE. 8-page bulletin F-1294 describes new, Oxweld CM-60 flame-cutting machine said to be the first unlimited capacity machine that can automatically reproduce metal parts from exact size drawings. (Write: *Linde Co., Division of Union Carbide Corp.*, Dept. RLC, 420 Lexington ave., New York 17.)

FASTENERS. 4-page bulletin, Form 8-471, describes and illustrates Huck CL, OS, Dr, 9SP and PT fasteners of particular interest to railroad design and maintenance engineers. Also briefly describes Huck installation tools and the Huck Powerig for use with hydraulic tools. (Write: *Huck Manufacturing Co.*, Dept. RLC, 2480 Bellevue ave., Detroit 7.)

STORAGE BATTERIES. 32-page booklet gives "Facts About Storage Batteries" for those who specify or work with storage batteries. (Write: *Exide Automotive Division*, Dept. RLC, P. O. Box TF 6266, Cleveland 1.)

**BAR GETS AUTOMOBILE-QUALITY FINISH**

**. . . WITH SPEE-FLO HOT SPRAY**

In its new $300,000 production-line paint installation, the Bangor-Aroostook Railroad now uses Spee-Flo Hot Spray Equipment to apply the synthetic enamel finishes used on the road's colorful fleet of 4,677 revenue cars. This finish is accomplished with hot spray in a single coat, 2 mils thick and at an average time savings of one-third over the old method.

Controlled hot spray gives uniform viscosity, regardless of weather, and results in a better finish with substantial savings in time and materials . . . improved quality and extended film longevity.

Let us arrange an on-the-job demonstration and you be the judge. Write for informative booklet "Why Hot Spray?"

THE SPEE-FLO COMPANY
6614 HARRISBURG • HOUSTON 11, TEXAS

154

## at the Allied Railway Supply Show...

*Chicago, September 20 to 23, 1959*

**At the Hotel Sherman • Booth No. 163**

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*to show you the important benefits you gain by using a single, experienced source, Pullman-Standard, for...*

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| Sides | Steel Floors |
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*Plus parts to your specifications for heavy rebuilding and repair.*

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BIRMINGHAM • PITTSBURGH • NEW YORK
J. C. Fennelly Co., San Francisco Representative

# Wrong Track

*(Continued from page 70)*

ment can run and bring the car temperature down."

Pete showed Red how to purge the air by closing valves on each side of the condenser. The compressor was shut off. The discharge service valve was "front seated," the receiver inlet valve was closed, and the front seat port plug on the discharge service valve was carefully loosened. Pete cautioned Red that carelessness here could result in the plug being blown out by the high pressure. When the vapor escaping around the plug began to flutter or "blubber," the plug was tightened. The valves were then opened and the system started.

"Red, notice that the discharge pressure has been lowered, but is still above normal."

"Can all of the air be removed this way?" asked Red.

"No, but we can reduce it enough to keep the equipment operating. We haven't fixed anything. Temporarily, we have overcome the difficulty and the equipment is cooling the car. Let's go call downtown and see if Zero Refrigeration Service might have a seal."

Their telephone call was unsuccessful. The two fellows then went back to the car and purged the system two more times and succeeded in lowering the discharge pressure to within 15 psi of normal pressure. Pete pointed out that they could lower it still further, but that this would require more time and more refrigerant might have to be added.

Big Jim, the boss, came up about this time and asked: "How about it; can I release the car?"

"Sure, Jim, any time. Be sure that everyone knows the compressor shaft needs to be replaced so the car won't be reloaded."

"You mean, Pete, you didn't fix it?" asked Jim with surprise.

"How can I fix it if I can't get the parts? This isn't one of our cars and our storehouse can't carry repair parts for everything. The car can go through; just warn everybody that we purged the air out of the system and that the seal needs replacing. The owners can then decide where they want the car sent for repairs."

"OK, Pete, OK," said Jim, "just as long as the car protects its load."

Big Jim could see that Pete was reverting to his typically grouchy self.


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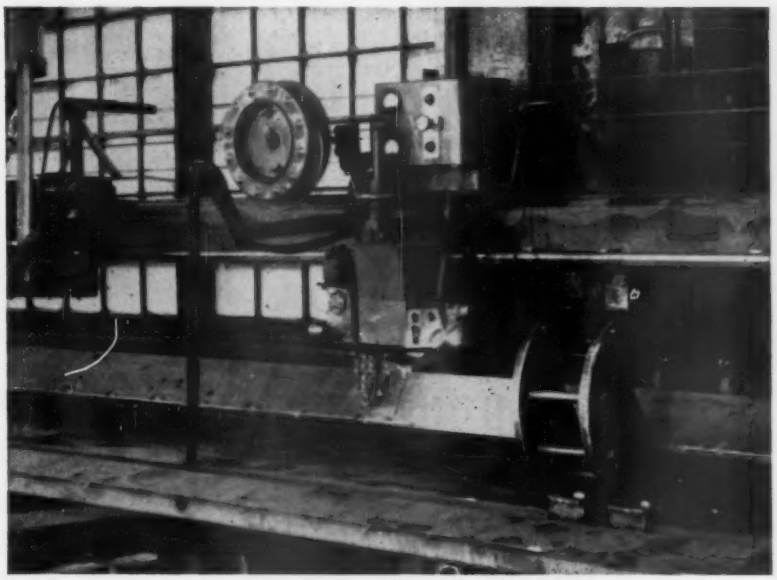

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